US006134534A

United States Patent [19]

Walker et al.

[11] **Patent Number: 6,134,534**

[45] **Date of Patent: *Oct. 17, 2000**

[54] **CONDITIONAL PURCHASE OFFER MANAGEMENT SYSTEM FOR CRUISES**

[75] Inventors: **Jay S. Walker**, Ridgefield; **Thomas M. Sparico**, Riverside; **T. Scott Case**, Darien, all of Conn.; **Bruce Schneier**, Minneapolis, Minn.

[73] Assignee: **priceline.com Incorporated**, Stamford, Conn.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/923,618**

[22] Filed: **Sep. 4, 1997**

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/889,319, Jul. 8, 1997, which is a continuation-in-part of application No. 08/707,660, Sep. 4, 1996, Pat. No. 5,794,207.

[51] **Int. Cl.**[7] **G06F 15/20**

[52] **U.S. Cl.** **705/26**; 705/5; 705/37

[58] **Field of Search** 705/26–27, 5, 705/13, 15, 37, 35; 295/226, 228, 236, 237, 239; 340/825.3

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,573,747	4/1971	Adams et al. .	
3,581,072	5/1971	Nymeyer	705/37
4,247,759	1/1981	Yuris et al.	235/381
4,449,186	5/1984	Kelly et al.	705/5
4,553,222	11/1985	Kurland et al.	705/15
4,677,552	6/1987	Sibley, Jr. .	
4,751,728	6/1988	Treat	379/113
4,789,928	12/1988	Fujisaki	705/37
4,799,156	1/1989	Shavit et al.	705/26
4,903,201	2/1990	Wagner	705/37

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

96/34356	10/1996	WIPO .
97/46961	12/1997	WIPO .

OTHER PUBLICATIONS

Lancorp Mortage Services, http://www.lancorp–mortgage-.com/retailpa.htm, 1998.

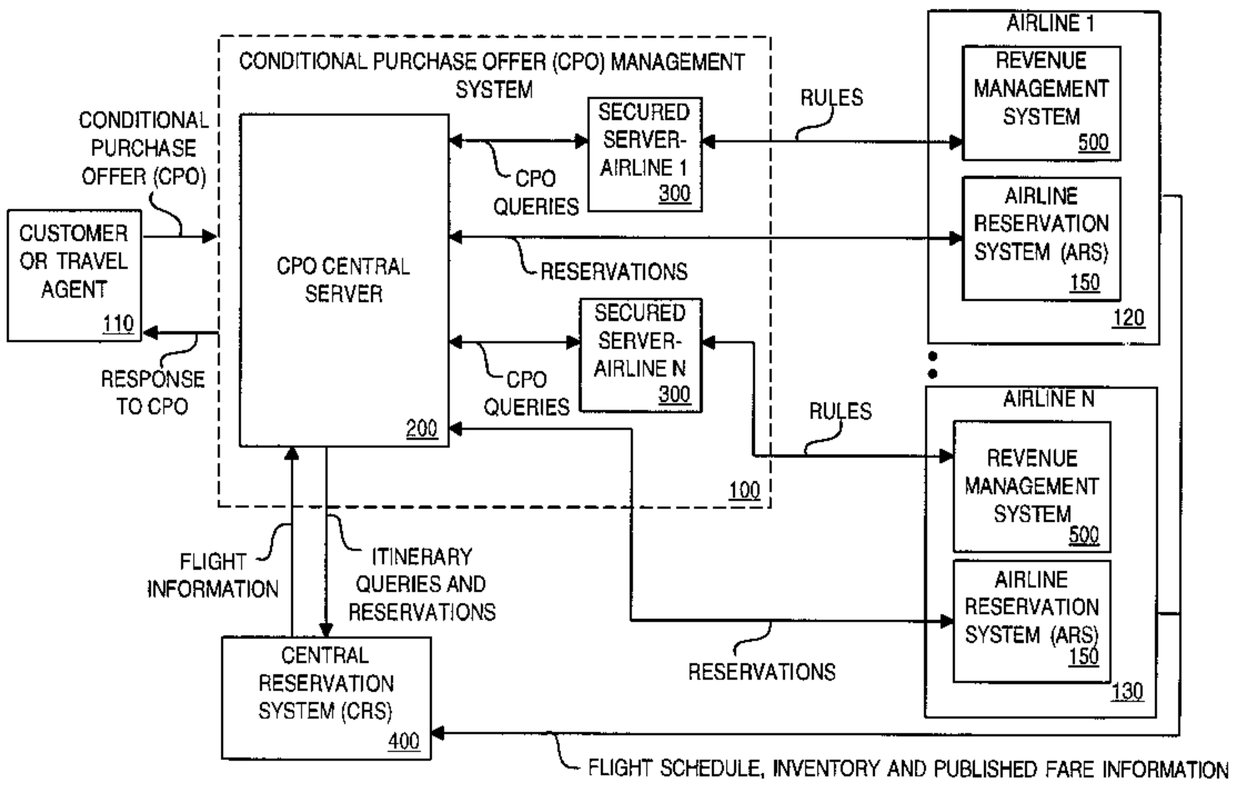
(List continued on next page.)

Primary Examiner—Allen R. MacDonald
Assistant Examiner—Penny Caudle
Attorney, Agent, or Firm—Morgan & Finnegan, L.L.P.; Jeffrey L. Brandt

[57] **ABSTRACT**

A conditional purchase offer (CPO) management system is disclosed for receiving CPOs from one or more customers, such as cruise and airline passengers, and for evaluating the received CPOs against a number of CPO rules defined by a plurality of sellers, such as cruise operators and airlines, to determine whether any seller is willing to accept a given CPO. A CPO is a binding offer containing one or more conditions submitted by a customer for purchase of an item, such as airline travel, at a customer-defined price. A CPO rule is a set of restrictions defined by a given seller, such as a cruise operator or an airline, to define a combination of restrictions for which the seller is willing to accept a predefined price. The CPO rules may be securely stored by one or more servers. The CPO management system permits a seller to correct for forecasting errors, if necessary, or other competitive forces which have produced excess capacity, by providing inventory for sale to CPO customers. If a CPO is accepted by more than one seller, the CPO management system executes a post-sell multi-bind process to permit each accepting seller to directly market to the customer and post-sell their product. Thus, the customer selects for himself which seller acceptance to utilize, based on materials furnished by each seller. The CPO management system may optionally also provide a CPO which specifies preferred sellers to the excluded sellers who may make counteroffers to the customer, in an attempt to obtain the business, before one of the specified sellers accepts the CPO.

12 Claims, 34 Drawing Sheets



U.S. PATENT DOCUMENTS

4,931,932	6/1990	Dalnekoff et al.	705/5
5,021,953	6/1991	Webber et al.	705/6
5,136,501	8/1992	Silverman et al.	705/37
5,168,446	12/1992	Wiseman	705/37
5,191,523	3/1993	Whitesage	705/6
5,191,613	3/1993	Graziano et al.	380/25
5,224,034	6/1993	Katz et al. .	
5,243,515	9/1993	Lee	705/37
5,253,165	10/1993	Leiseca et al.	705/5
5,262,941	11/1993	Saladin et al.	705/38
5,283,731	2/1994	Lalonde et al.	705/1
5,297,031	3/1994	Gutterman et al.	705/37
5,329,589	7/1994	Fraser et al.	379/91.02
5,331,546	7/1994	Webber et al.	705/6
5,361,199	11/1994	Shoquist et al.	705/26
5,404,291	4/1995	Kerr et al.	705/5
5,420,914	5/1995	Blumhardt	379/114
5,426,281	6/1995	Abecassis	235/379
5,444,630	8/1995	Dlugos	705/402
5,467,269	11/1995	Flaten	705/14
5,500,793	3/1996	Deming, Jr. et al.	705/37
5,517,555	5/1996	Amadon et al.	455/408
5,519,769	5/1996	Weinberger, et al.	379/112
5,553,131	9/1996	Minervino, Jr. et al.	379/221
5,557,517	9/1996	Daughterty, III	705/37
5,557,518	9/1996	Rosen .	
5,570,283	10/1996	Shoolery et al.	705/5
5,592,375	1/1997	Salmon et al.	705/7
5,606,602	2/1997	Johnson et al.	379/115
5,611,052	3/1997	Dykstra et al.	705/38
5,615,269	3/1997	Micali	380/49
5,664,115	9/1997	Fraser	705/37
5,689,652	11/1997	Lupien et al.	705/37
5,694,551	12/1997	Doyle et al.	705/26
5,696,965	12/1997	Dedrick	7/10
5,715,402	2/1998	Popolo	705/37
5,717,989	2/1998	Tozzoli et al.	705/37
5,732,400	3/1998	Mandler et al.	705/26
5,745,882	4/1998	Bixler et al. .	
5,757,917	5/1998	Rose et al.	380/25
5,758,328	5/1998	Giovannoli	705/26
5,774,883	6/1998	Andersen et al.	705/38
5,794,207	8/1998	Walker et al.	705/1
5,794,219	8/1998	Brown	705/37
5,797,127	8/1998	Walker et al.	705/5
5,799,285	8/1998	Klingman	7105/26
5,809,478	9/1998	Greco et al.	705/4
5,826,244	10/1998	Huberman	705/37
5,832,452	11/1998	Schneider et al.	705/5
5,835,896	11/1998	Fisher et al.	705/37
5,845,265	12/1998	Woolston	705/37
5,878,403	3/1999	DeFrancesco et al.	705/38

OTHER PUBLICATIONS

Inland Mortgage Corporation, http.//inlandmortgage.com/index.htm, 1998.

The Mortage Store, http.//www.mortgagestore.com, 1998.

Golden Age Antiques and Collectibles Online Auction.http://www goldage.com, 1997.

Moran, Susan, "Xerox Won't Duplicate Past Errors", Business Week, Sep. 29, 1997.

Coleman, Zach, "Electronic Trading System Matches Buyers, Seller", Atlanta Business Chronicle, vol. 20; No. 12; p. 37A, Aug. 22, 1997.

"What's Holding Up E–Cash?", Cybernautics Digest, vol. 3: No. 7, Finance.

Resnick, Paul et al, "Roles For Electronic Brokers",*http://ccs mir.edu/CCSWP179 htm* 1997.

Philarelists Online Information ,*hhtp//www506.bonsai.com/q/@131354lhyhf/mfop.hml.* 1997

Sports trade Information, *http://www.sportstrade com/mfos.html*, 1997.

Numismatists Online Information, *http://www numismatists.com/info html*, 1997.

Sell and Trade Internet Marketplace, Sell and Trade, *http://sellandtrade.com/script/main asp*, 1997.

Kay, Alan, "Chapter 7 Future Research", 1997.

Trade–direct,*http://www.trade–direc com* 1997.

"Internet Mortgage Service Elimintes Loan Agents and Passes Commissions on to the Comsumer", Yahoo! Finance, 1997.

Negroponte, Nicholas, "Pay Whom Per What When, Part 2", Negroponte, Issue May 3, 1997.

"Ticketing revolution Could Triple Airline Profits, Analyst Says", Aviation Daily, vol. 325; No. 11: p. 87, 1996.

"Auctioning Unsold Airline Tickets", adapted extract from Insight (USA), The Global Ideas Bank, 1996.

Rockoff, Todd E., et al., "Design of an Internet–based system for remote Dutch auctions," Internet Research: Electronic Networking Applications and Policy, vol. 5, No. 4 pp. 10–16, 1995.

Franklin, Matthew K., et al., "The Design and Implementation of a Secure Auction Serivce," Proceedings: 1995 IEEE Symposium on Security and Privacy, pp. 2–14, 1995.

Tenenbaum, Jay M., et al., "CommerceNet: Spontaneous Electronic Commerce on the Internet," 1995 IEEE Spring Conference. pp. 38–43.

Sirbu, Marvin and Tygar, J.D., "NetBill: An Internet Commerce System Optimized for Network Delivered Services," IEEE 1995 Spring Conference, pp. 20–25.

Bunker, Ted, "How Auction Technology Sped And Enhanced Sale Of Radio Licenses,"Investor's Business Daily, Executive Update, Regulation, pg. A3. Feb. 24, 1995.

"Aucnet: The Story Continues", Harvard Business School, Jan. 17, 1995.

Anand, R., and Rao, M. Padmaja, "The Electronic Flea Market", IBM Research Division: Research Report, pp. 1–18, Jul. 28, 1994.

"Unusual Farmland Auction Set," Harrison Scott Publications, Liquidation Alert, Mar. 28, 1994.

"The Computer Museum brings auction block to cyberspace in First Internet Auction," Business Wire, Mar. 14, 1994.

Freeman, Brian and Gideon, Lidor, "Hosting Services —Linking the Information Warehouse To the Information Consumer," IEEE 1994 Spring Conference, pp. 165–171.

Booker, Ellis, "Mega real estate auction counts on imaging," Computerworld, p. 20, Dec. 7, 1992.

Abstract "A forward/reverse auction algorithm for asymmetric assignment problems," Computational Optimization and Applications, Dec. 1992.

Abstract "Marketel Shuts Doors," Travel Agent Magazine, Mar. 23, 1992.

Cass, Maxine, "West Coast Agents Remain Skeptical About New Air Ticket Sales Plan; Marketel: Airline ticket sales system sparks concern," Travel Agent Magazine, p. 50, Sep. 2, 1991.

Bookit !"Airline Ticket Purchase Order For Business & Leisure Travel", Marketel International, Inc. 1991.

Inhaber, Herbert, "How To Solve the Problem of Suing Nuclear Waste," Transactions of the American Nuclear Society, vol. 62, Nov. 11–15, 1990.

Dyson, Esther, "Information, Bid and Asked," Forbes, Aug. 20, 1990.

"Mercado electronico, El chance de regatear por computador", CIENCIA Technologia E Informatica, Mar. 21, 1990.
Cole, Jeff, "Fare bidding plan could be the ticket", St. Paul Pioneer Press Dispatch, Mar. 11, 1990.
Miller, Ross M., "The Design of Decentralized Auction Mechanisms that Coordinate Continuous Trade in Synthetic Securities," Journal of Economics Dynamics and Control, pp. 237–253, 1990.
"Business Briefing, Airline Seats May Go on the Auction Block", Insight on the news, Dec. 4, 1989.
"Business Travel Update, Automation", A Travel Weekly, Nov. 27, 1989.
Munro, Don and McCann, David, "A New Way To Purchase Travel, Automated Service Would Let Companies Bid For Already–Filled Airline Seats", Business Travel News, Nov. 6, 1989.
"An Electronic Auction Ahead For Airline CRS's?", The Business Week Newsletter for Information Executives, Oct. 27, 1989.
Cohen, Danny, "Electronic Commerce," ISI Research Report, University of Southern California, Oct. 1989.
"From Airline Tickets to Human organs, the Electronic Markets are Booming", Times, vol. 3, No. 50, Aug. 14, 1989.
Coyne, Andrew, "Unbundling ideas may alter world of politics," The Financial Post (Toronto), Section 1, . 11, Sep. 27, 1989.
Malone, Thomas W, et al., "Electronic Markets and Electronic Hierarchies," Communications of the ACM, vol. 30, No. 6, Jun. 1987.
"AUCNET.TV Auction Network System," Harvard Business School, Jul. 19, 1989.
Sammer, Harald W., "Online Stock Trading Systems: Study of an Application," IEEE 1987 Spring Conference, pp. 161–162.
Littlefair, T., "Homelink: a unique service," Computer Bulletin, pp. 12–14, Jun. 1986.
Banatre,Jean–Pierre, et al., "The Design and Building of Echere, a Distributed Electronic Marketing System," Communications of ACM, vol. 29, No. 1, Jan. 1986.
Turoff, Murray and Chinai, Sanjit, "An Electronic Information Marketplace," Elsevier Science Publishers B.V., pp. 79–90, 1985.
Banatre, Michel, "Distributed auction bidding system," IPC Business Press, Computer Communications, vol. 4, No. 4, Aug. 1981.
Fishkin, Ken, Foresight Exchange Tutorial: (http://www.ideosphere.com/fx/docs/tutorial.html) Feb. 19, 1999 at p. 1–5.
"Bid.com 1998 Third–Quarter Revenue Increases 12.5 Percent From Second Quarter", Business Wire, Oct. 29, 1998.
Final Report: Virtual Hospital (http://www.telemed.medadmin.uiowa.edu/TRCDocs/Pubs/FinalReport/cVirtualH/virtualH/virtualh02.html), download date: Sep. 20, 1998.
"First Source Become a Member", More Reasons To Join First Source! (http://www.fsource.com/bene.html), download date: Sep. 20, 1998.
Jeffrey Davis, "Big Storm rising", Business 2.0, Sep., 1998 at p. 60.
Suite 101.com (http://www.suite101.com/doc.cfm.presskit/questions), 1998.
Web Marketing Today (http.www.wilsonweb.com/rfwilson/wmt2/issue36htm) dated Sep. 1, 1997, download date: Sep. 17, 1998.
"Free Stuff Internet Site Delivers for Viewers and Advertisers Alike", Press Release of PromoNet Interactive, Inc. dated Nov. 10, 1997.
About Iao, selected pages downloaded from www.iaoauction.com on Sep. 8, 1997 and Sep. 18, 1997.
Onsale: Auction Supersite, selected pages downloaded from www.onsale.com on Sep. 8, 1997.
Hapgood, Fred 'bidder Harvest, Sep. 1997, p. 58.
NASDAQ: What is NASDAQ?, selected pages downloaded from http.//home.axford.com on Aug. 15, 1997.
NASDAQ Consolidated Subscriber Agreement, downloaded from www.pcquote.com/exchanges on Aug. 15, 1997.
TradingFloor: General Trading Information and Terms, downloaded from www.tradingfloor.com on Aug. 14, 1997.
HomeShark: Refinance Check, selected pages downloaded from www.homeshark.com on Aug. 13, 1997.
The Loan Process, downloaded form www.sdtech.com/mls/process on Aug. 7, 1997.
Trade–Direct: We Help You Trade With Confidence, selected pages downloaded from www.tradedirect.com on Aug. 6, 1997.
Classifieds2000: The Internet Classifieds, selected pages downloaded from www.classifieds2000.com on Aug. 6, 1997.
Internet Mortgage Service Eliminates Loan Agents and Passes Commissions on to the Consumer, Company Press Release, Yahoo Business Wire (Jun. 30, 1997).
Frequently Asked Questions About: Airhitch, selected pages downloaded from www.isicom.com.fr/airhitch on May 6, 1997.
Hitch a Flight to Europe, selected pages downloaded from www.travelassist.com on May 6, 1997.
Airhitch: Your Way to Low Cost Travel, selected pages downloaded from www.vaportrails.com on May 6, 1997.
Kelsey, J. and Schneier, B,. Conditional Purchase Orders, 4th ACM Conference on Computer and Communications Security, ACM Press, 117–124 (Apr. 1997).
Bryant, Adam, "Shaking Up Air Fares' Status Quo", The New York Times, Mar. 31, 1997.
Silverman, Robert, "GM Drives Wed Ad Insertion Network", Inside Media, Feb. 26, 1997, vol. 9, No. 4, p. 1; ISSN: 1046–5316.
"Flycast Introduces Unique [Open Exchange] Match–Making Service", Interactive Marketing News, Feb. 21, 1997, vol. 4, No. 8.
"UK's "World Telecom Unveils New WorldSaver Tariffs, Newsbytes, Information Access Company (Feb. 13, 1997).
"TransQuest and Web Ventures Deliver Internet Booking for Delta Air Lines", PR Newswire, Dec. 10, 1996, Financial News Section.
"Affinicast Enables Web Sites That Listen and Adapt to Customer Affinities", PR Newswire, Dec. 3, 1996.
"Web Ventures Presents BookIt!" press release printed from http://www/webventures.com/bookit/(Web Ventures World Wide Web site) on Dec. 2, 1996.
"World's First Real–Time Travel Auction Service to Be Available Via World Wide Web: ETA To Open Bidding to Consumers," Business Wire, DIALOG Trade & Industry Database (Nov. 4, 1996).
Gessel, Chris, "Trade Smarter: The Limit of Orders", Investor's Business Daily, Oct. 14, 1996, p. A1.
CREST: Cruise/Ferry Revenue Management System, selected pages downloaded from www.rtscorp.com on Aug. 5, 1996.

Nishimoto, Lisa, "Travel Services Are First Online Commerce Offerings to Fly, " Infoworld, Jul. 29, 1996, downloaded from http://www.infoworld.com.
About Rate Hunter, dowloaded from http://207.49.64.77/rhprodrh.htm on Jul. 14, 1996.
Cathay Pacific Online Ticket Bidding, World Internet News Digest (May 8, 1996).
Sothbey's General Information, downloaded from www.sothebys.com (1996).
CyberBid, Net Fun Ltd.(1996).
Nimmer, Raymond, T., "Electronic Contracting; Legal Issues", 14 J. Marshall J. Computer & Info L.211, Winter, 1996.
American Law Institute, Draft–Uniform Commercial Code Revised Article 2 (Sales), parts 2, 3, and 7, pp. 1–15, Jan. 4, 1996.
Speidel, Richard E. & Schott, Lee A., "Impact of Electronic Contracting on Contract Formation Under Revised UCC Article 2, Sales", C878 ALI–ABA 335, Dec. 9, 1993.
Hainer, Cathy and Grossman, Cathy Lynn, "Where Vacationing Kids Get Good Care", USA Today, Apr. 1, 1992, at p. 4D.
Del Russo, Laura, "Ticket–Bidding Firm Closes Its Door," Travel Weekly, Mar. 12, 1992.
"Newsletters", The Atlanta Constitution, Mar. 1, 1992, p. K13.
"CRTL'Blue Ribbon Deals for 1992", Consumer Reports Travel Letter, Jan. 1992, vol. 8, No. 1, at pp. 3–5.
Traveler's Notes; Bookit Report, Consumer Reports Travel Letter, Dec. 1991 at p. 143.
Feldman, Joan M., "To Rein In Those CRSs; Computer Reservation Systems", Air Transport World, Dec. 1991, at p. 89.
"Money Briefs; Buy Low, Fly High", Gannet News Service, Nov. 20, 1991.
"Buy Low, Fly High", USA Today, Nov. 14, 1991 at p. 15.
Traveler's Notes; Easier Airfare Bidding, Consumer Reports Travel Letter, Oct. 1991 at p. 119.
Nelson, Janet "Practical Traveler; Airlines Relaxing Policy on No–Refund Tickets", The New York Times, Sep. 22, 1991 at p. 3 of Section 5.
Pelline, Jeff, "New Service; Now You Can Make A Bid on Your Next Airline Ticket Home", The Orange County Register, Sep. 1, 1991 at p. E01.
"Bookit Airfare Bidding System (Fax for Your Plane Ticket?)", Consumer Reports Travel Letter, Sep. 1991, p. 97 & 106.
Upton, Kim "French Say Monoliths Off–Limits to Visitors", Los Angeles Times, Aug. 25, 1991.
Pelline, Jeff, "Travelers Bidding on Airline Tickets; SF Firm Offers Chance for Cut–Rate Fares", San Francisco Chronicle, Section A4, Aug. 19, 1991.
Carey, Christopher, "Firm Offers Auction For Airline Tickets", St. Louis Post–Dispatch, Aug. 7, 1991 at p. 1B.
Del Rosso, Laura, "Marketel Says It Plans To Launch Air Fare [Auction] in Jun.", Travel Weekly, Apr. 29, 1991.
NASDAQ Adds Enhancements to SOES Limit Order File, Securities Week, Nov. 26, 1990, p. 5.
Ritter, Jeffrey B., "Scope of the Uniform Commercial Code: Computer Contracting Cases and Electrical Commercial Practices", 45 Bus. Law 2533, Aug., 1990.
Greenburg, Peter, S., "Judging DeRegulation", The Record, Jul. 22, 1990 at p. T01.
Greenburg, Peter S., "The Savvy Traveler: Lower Air Fares for Consumers Not in the Cards; Airlines: Remember When It Cost $16 to fly From Los Angeles to San Francisco? Then You Remember the Days Before DeRegulation. Since Then, Prices Have Soared", Los Angeles Times, Jul. 8, 1990 at p. L2.
Wallace, David, "Company Planning to Let Fliers Bid on Airfares", Philadelphia Business Journal, Mar. 26, 1990 at p. 15.
"Letter to Business Extras", The San Francisco Chronicle, Dec. 26, 1989 at p. C7.
Schrage, Michael, "An Experiment in Economic Theory; Labs Testing Real Markets", The Record Section B1, Nov. 26, 1989.
Schrage, Michael Innovation/Micheal Schrage: Laboratory Experiments with Market Economics, Los Angeles Times, Nov. 23, 1989 at p. D1.
Golden, Fran "AAl's Riga Doubts Marketel's Appeal to Retailers", Travel Weekly, Nov. 13, 1989.
Del Rosso, Laura, Firm Proposes ticket–bidding system; Marketel explores electronic auction of travel; Marketel International., Travel Weekly, Section No. 91. vol. 48, p. 1; Nov. 13, 1989.
Carlsen, Clifford, "Polaris Group Set to Fly the Leveraged Sky", San Francisco Business Times, Nov. 6, 1989 at p. 1.
Kuttner, Robert, "Computers May Turn the World into One Big Commodities Pit", Business Week, Sep. 11, 1989.
Carlsen, Clifford, "From Airline Tickets to Human Organs, the Electronic Markets Are Booming"San Francisco Business Times, Aug. 14, 1989 at p. 17.
"Public May Submit Bids To Get Bargins Rates", Wall Street Journal, Section 2: p. 1, Column 1; Aug. 1, 1989.
American Airlines Internet Silent Auction, selected pages downloaded from www.americanair.com.
Apollo Host Computer, selected pages downloaded from www.appollo.com.
"Auctioning unsold airline tickets." (http://www.new-civ.org./GIB/BOV–409.HTMI), at p. 1.
Cathay Pacific:CyberTraveler Auction #3 —Official Rules, selected pages downloaded from www.cathaypacific.com.
CMS Online: About Collector's Super Mall downloaded from www.csmonline.com.
Sabre Decision Technologies, selected pages downloaded from www.sabre.com.
PhoneMiser: Frequently Asked Questions, downloaded from www.phonemiser.com.
The United Computer Exchange: How It All Works, selected pages downloaded from www.uce.com.
Tired of Shopping For the Best Home Loan?, Mortgage Loan Specialists.
Koepper, Ken, "Room Inventory Auctioning: The Next CRS Generation", Lodging, Jan. 1990 at p. 26, 29–30.

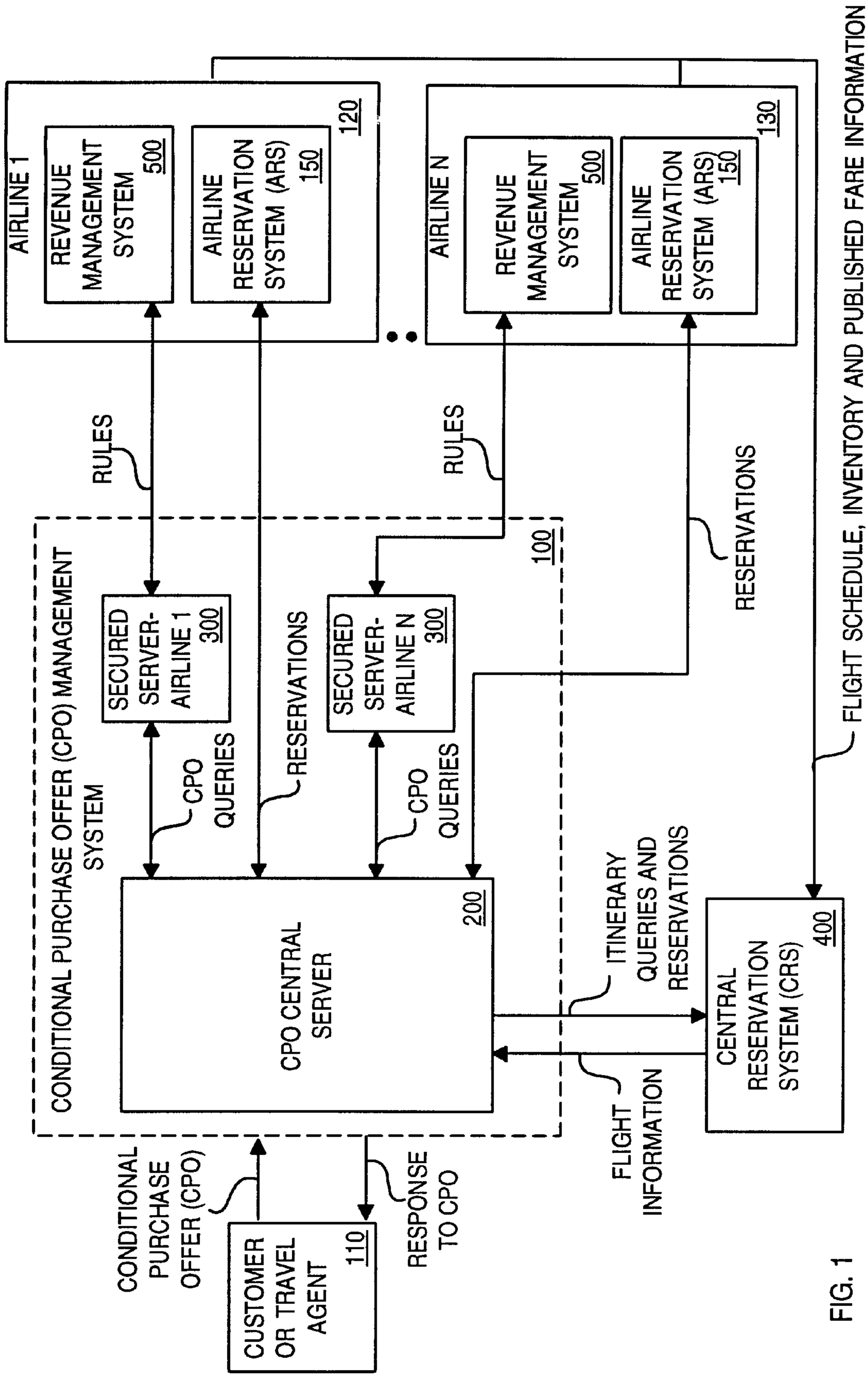

AIRLINE 1
REVENUE MANAGEMENT SYSTEM 500
AIRLINE RESERVATION SYSTEM (ARS) 150
120
AIRLINE N
REVENUE MANAGEMENT SYSTEM 500
AIRLINE RESERVATION SYSTEM (ARS) 150
130
RULES
RULES
RESERVATIONS
FLIGHT SCHEDULE, INVENTORY AND PUBLISHED FARE INFORMATION
CONDITIONAL PURCHASE OFFER (CPO) MANAGEMENT SYSTEM
100
SECURED SERVER-AIRLINE 1 300
SECURED SERVER-AIRLINE N 300
CPO QUERIES
RESERVATIONS
CPO QUERIES
CPO CENTRAL SERVER
200
ITINERARY QUERIES AND RESERVATIONS
FLIGHT INFORMATION
CENTRAL RESERVATION SYSTEM (CRS)
400
CONDITIONAL PURCHASE OFFER (CPO)
RESPONSE TO CPO
CUSTOMER OR TRAVEL AGENT
110

FIG. 1

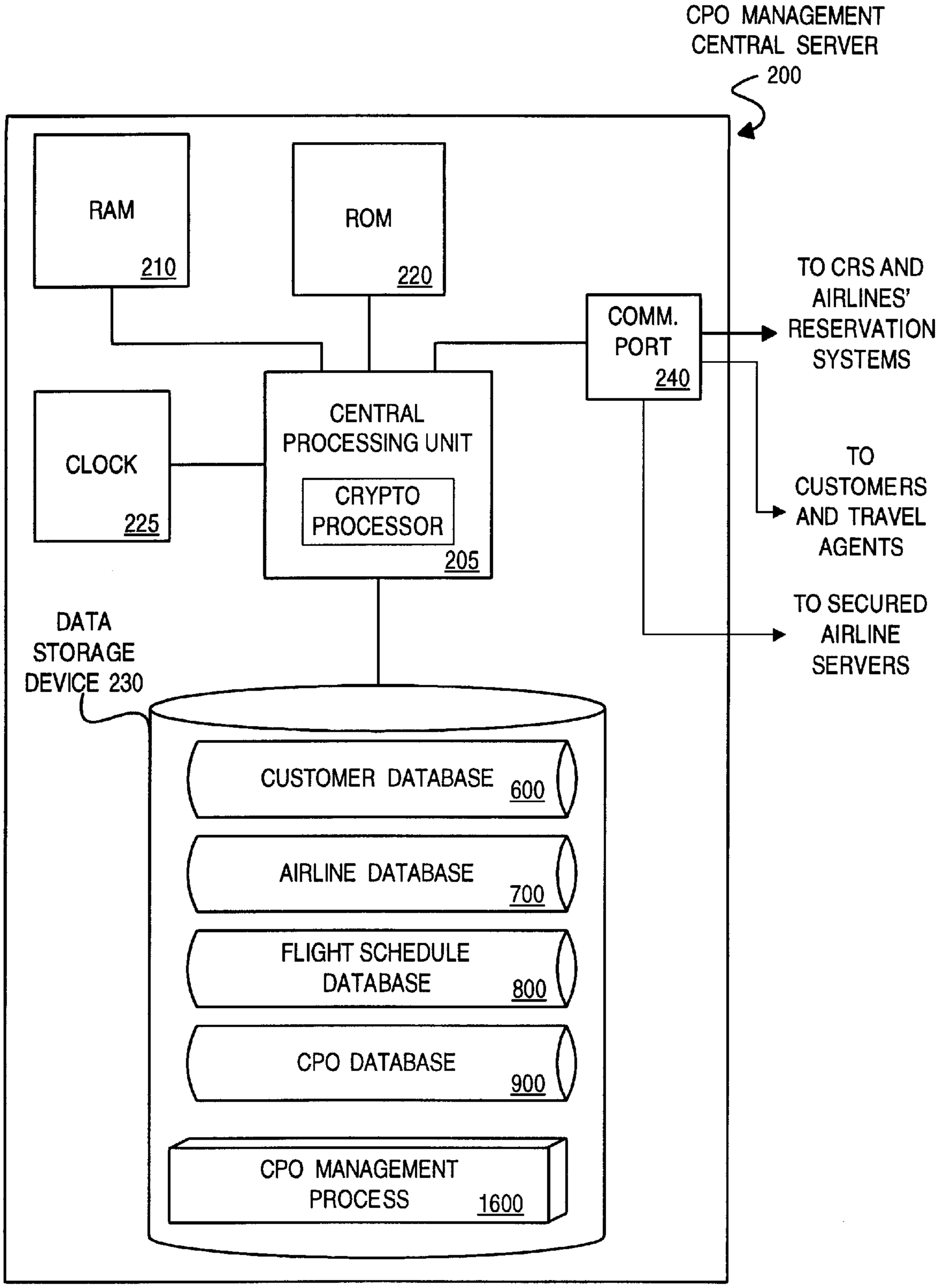

CPO MANAGEMENT CENTRAL SERVER
200
RAM
210
ROM
220
COMM. PORT
240
TO CRS AND AIRLINES' RESERVATION SYSTEMS
CLOCK
225
CENTRAL PROCESSING UNIT
CRYPTO PROCESSOR
205
TO CUSTOMERS AND TRAVEL AGENTS
TO SECURED AIRLINE SERVERS
DATA STORAGE DEVICE 230
CUSTOMER DATABASE 600
AIRLINE DATABASE 700
FLIGHT SCHEDULE DATABASE 800
CPO DATABASE 900
CPO MANAGEMENT PROCESS 1600

FIG. 2

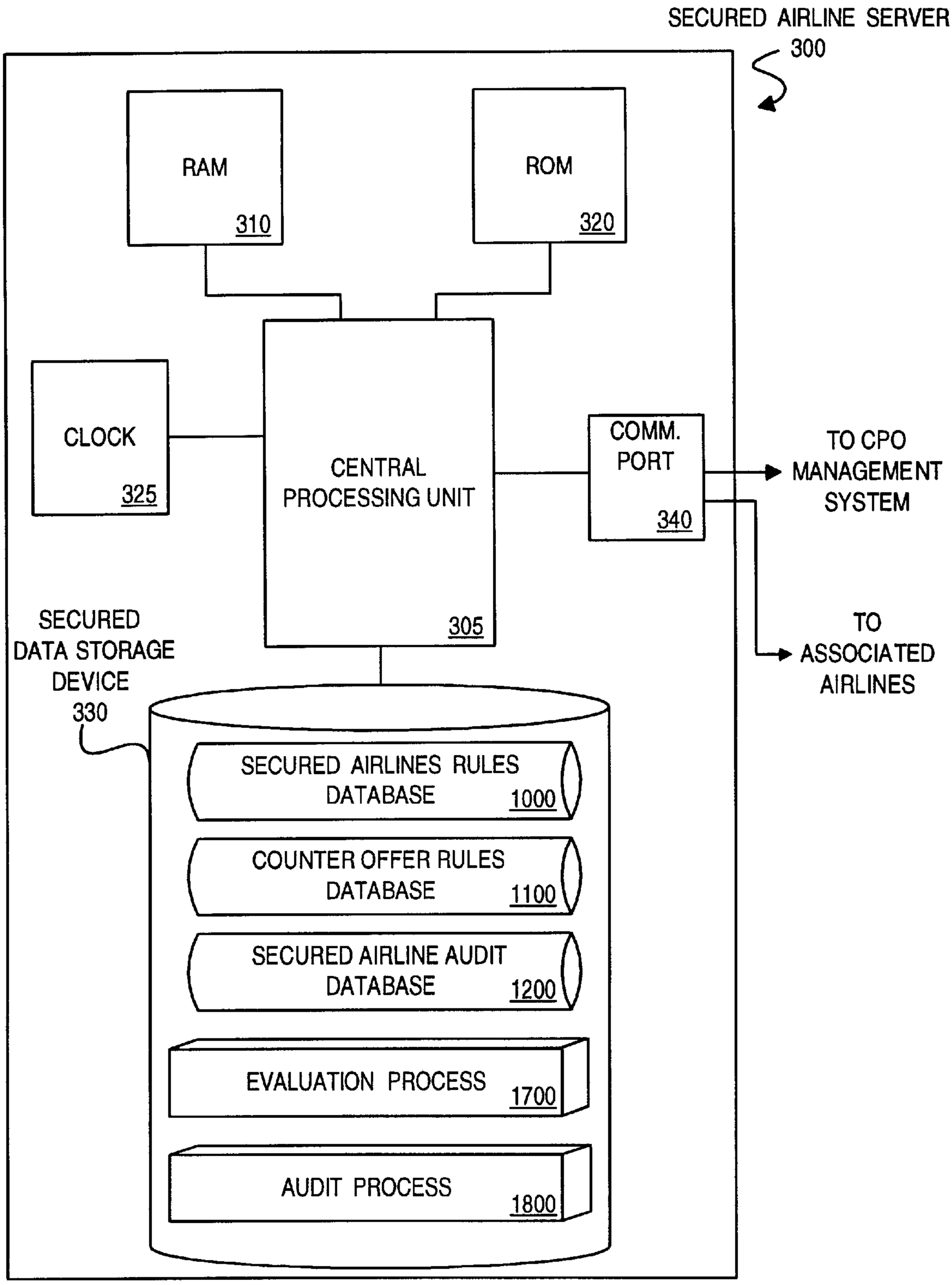

SECURED AIRLINE SERVER
300
RAM
310
ROM
320
CLOCK
325
CENTRAL PROCESSING UNIT
305
COMM. PORT
340
TO CPO MANAGEMENT SYSTEM
TO ASSOCIATED AIRLINES
SECURED DATA STORAGE DEVICE
330
SECURED AIRLINES RULES DATABASE
1000
COUNTER OFFER RULES DATABASE
1100
SECURED AIRLINE AUDIT DATABASE
1200
EVALUATION PROCESS
1700
AUDIT PROCESS
1800

FIG. 3

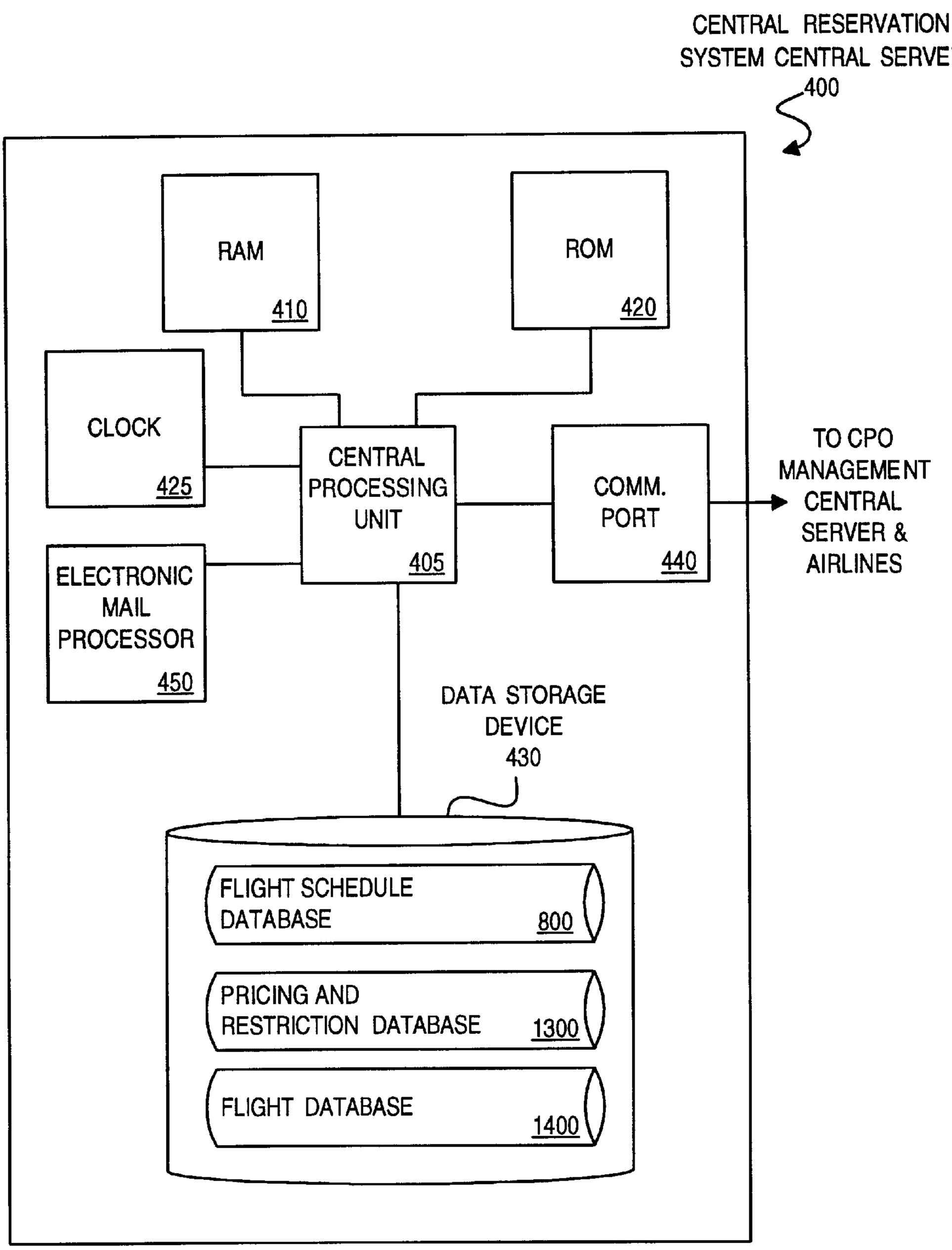

CENTRAL RESERVATION
SYSTEM CENTRAL SERVER
400
RAM
410
ROM
420
CLOCK
425
CENTRAL
PROCESSING
UNIT
405
COMM.
PORT
440
TO CPO
MANAGEMENT
CENTRAL
SERVER &
AIRLINES
ELECTRONIC
MAIL
PROCESSOR
450
DATA STORAGE
DEVICE
430
FLIGHT SCHEDULE
DATABASE
800
PRICING AND
RESTRICTION DATABASE
1300
FLIGHT DATABASE
1400

FIG. 4

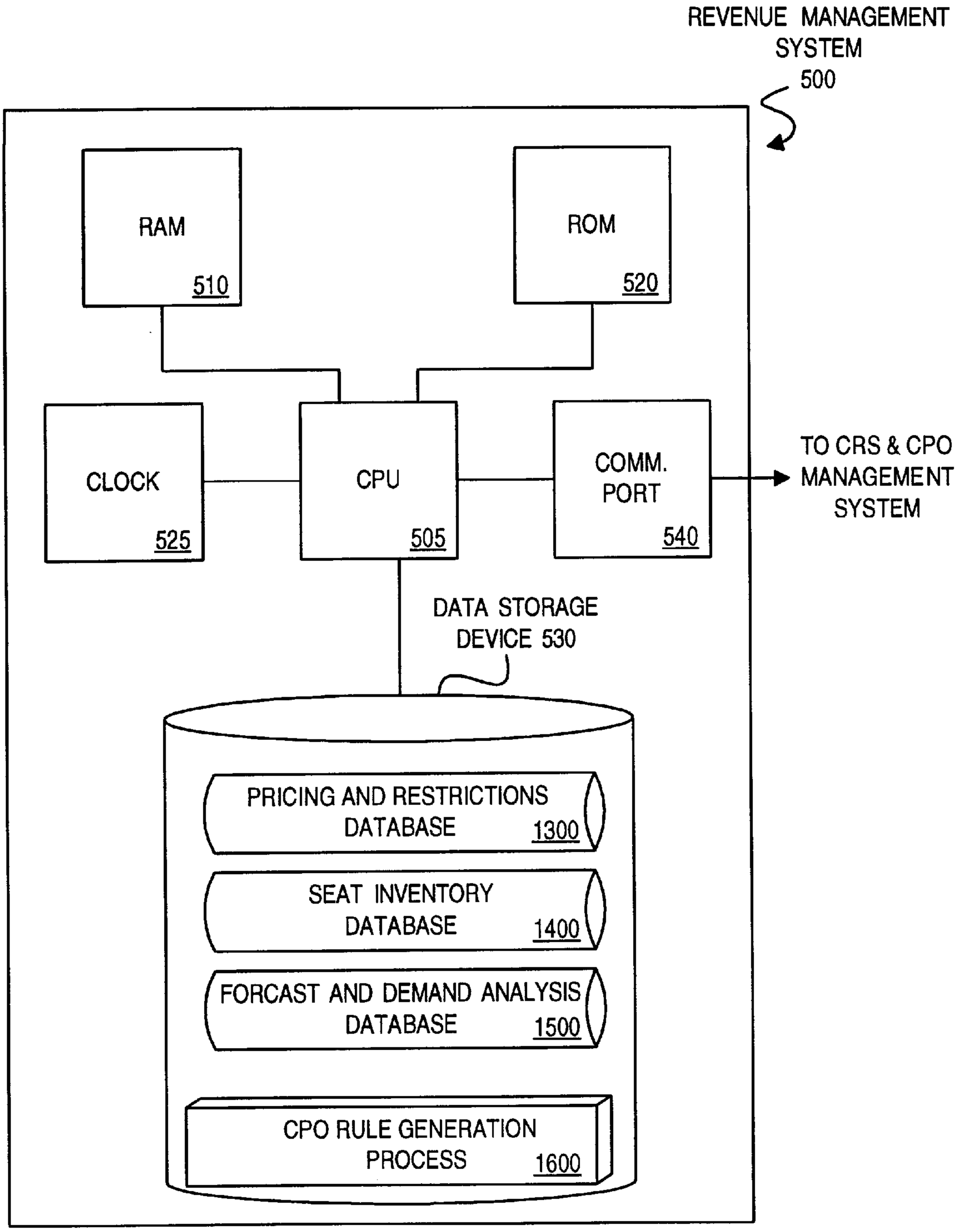

REVENUE MANAGEMENT SYSTEM
500
RAM
510
ROM
520
CLOCK
525
CPU
505
COMM. PORT
540
TO CRS & CPO MANAGEMENT SYSTEM
DATA STORAGE DEVICE 530
PRICING AND RESTRICTIONS DATABASE
1300
SEAT INVENTORY DATABASE
1400
FORCAST AND DEMAND ANALYSIS DATABASE
1500
CPO RULE GENERATION PROCESS
1600

FIG. 5a

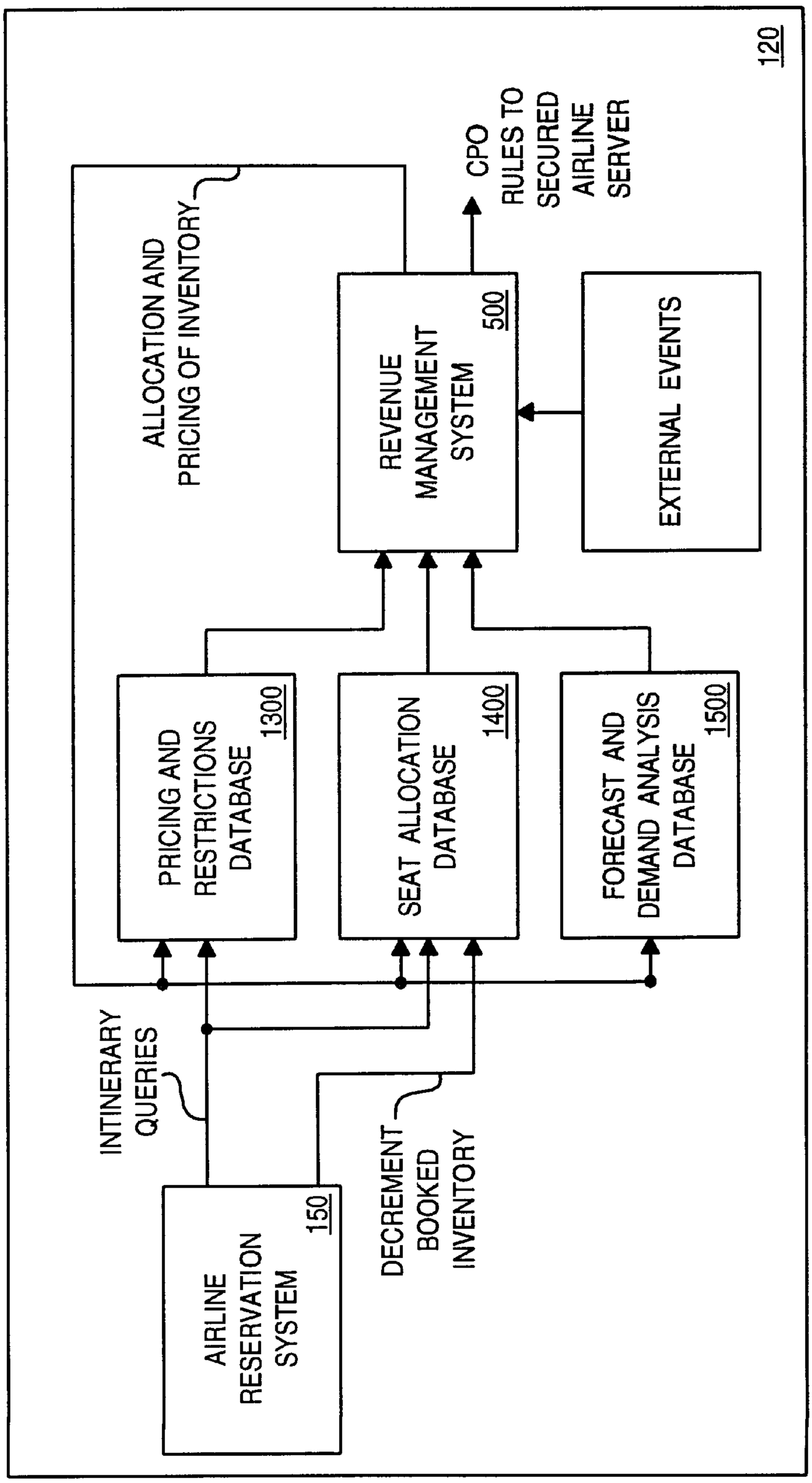

120
CPO
RULES TO
SECURED
AIRLINE
SERVER
ALLOCATION AND
PRICING OF INVENTORY
REVENUE
MANAGEMENT
SYSTEM
500
EXTERNAL EVENTS
PRICING AND
RESTRICTIONS
DATABASE
1300
SEAT ALLOCATION
DATABASE
1400
FORECAST AND
DEMAND ANALYSIS
DATABASE
1500
INTINERARY
QUERIES
DECREMENT
BOOKED
INVENTORY
AIRLINE
RESERVATION
SYSTEM
150

FIG. 5b

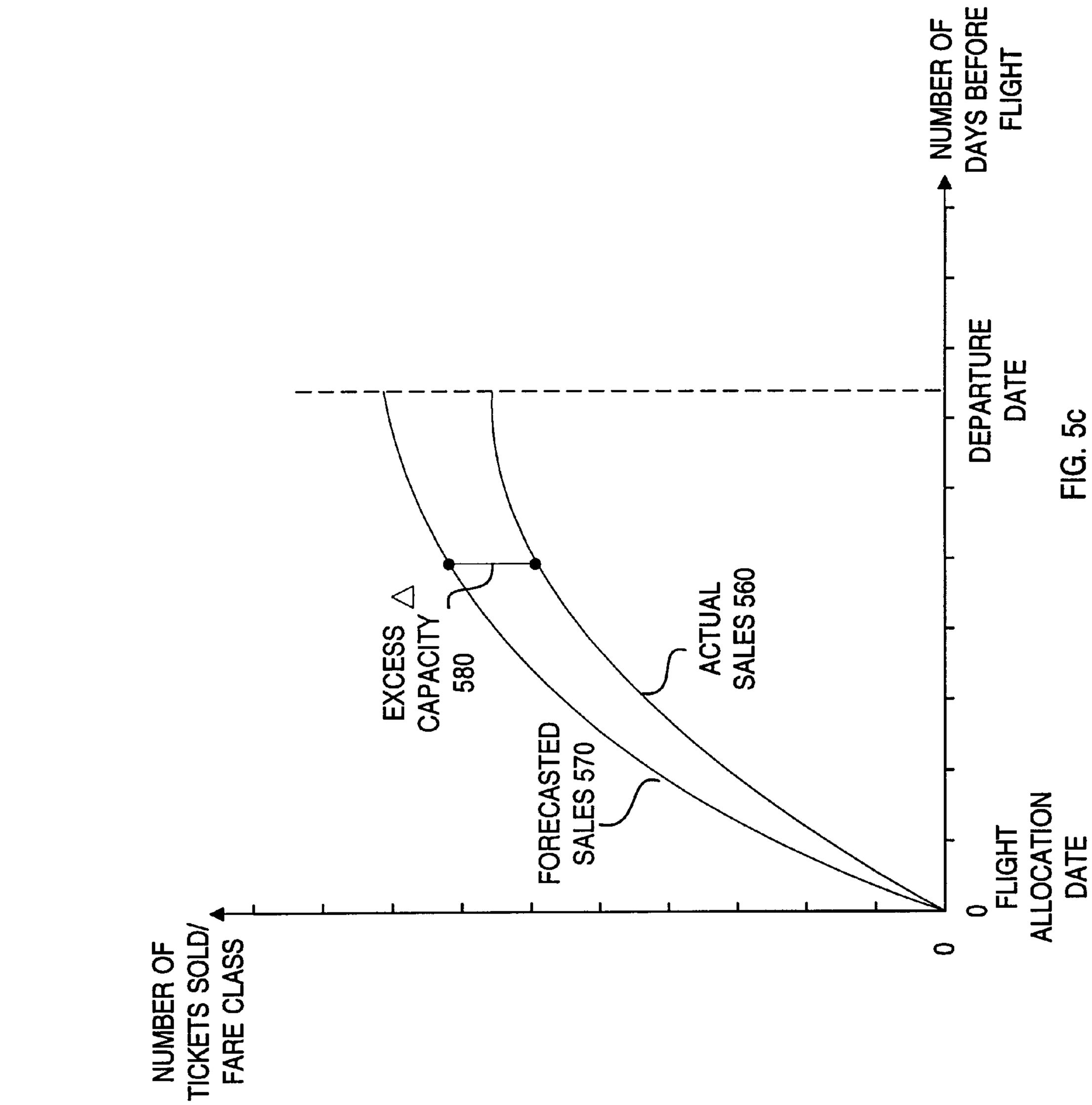

NUMBER OF TICKETS SOLD/ FARE CLASS
NUMBER OF DAYS BEFORE FLIGHT
DEPARTURE DATE
EXCESS CAPACITY 580
FORECASTED SALES 570
ACTUAL SALES 560
0
0
FLIGHT ALLOCATION DATE

FIG. 5c

CUSTOMER DATABASE 600

ID NUMBER 660	NAME 640	ADDRESS 645	CREDIT CARD NUMBER 655
234546	GIACOMO SORENTINO	23 MAIN ST, BRIDGEPORT, CT	2222-3333-4444-5555
65432	BOBBY VALENTINO	43 PARK ST., HARTFORD, CT	9999-8888-7777-6666
98765	JOE SMITH	102 PINE ST. WATERBURY, CT	6767-9898-0101-2323
605	610	615	

FIG. 6

AIRLINE DATABASE 700

AIRLINE NAME 740	ADDRESS 745	CONTACT 750	PUBLIC KEY 755	CPO ACCEPTANCE RATE 760
AMERICAN 705	25 MAIN STREEET, CHICAGO, IL	SUE JOHNSON	12347AD73E	37%
DELTA 710	102 45TH ST. NEW YORK, NY	BILL JOHNSON	35627A7C9	46%
UNITED 715	9492 6TH AVE. NEW YORK, NY	JOHN WILLIAMSON	1829CB612	4%

FIG. 7

FLIGHT SCHEDULE DATABASE 800

ORIGINATING AIRPORT 840	DESTINATION AIRPORT 845	DATE 850	TIME OF DEPARTURE 855	TIME OF ARRIVAL 860	AIRLINE 865	FLIGHT NUMBER 870	VIA 875
NASHVILLE, TN (BNA) 805	LOS ANGELES, CA (LAX)	12/12/96	12:00PM	6:00PM	AMERICAN	1870	NON-STOP
NEW YORK CITY (JFK) 810	LOS ANGELES, CA (LAX)	01/01/97	7:00AM	3:04PM	AMERICAN	226	CHICAGO
NEW YORK CITY (JFK) 815	SAN FRANCISCO, CA (SFO)	03/03/97	3:00PM	7:10PM	UNITED	300	NON-STOP

FIG. 8

CPO DATABASE 900

CPO NUMBER 920	DATE 925	TRAVEL AGENT NUMBER 930	PRIMARY PASSENGER NAME 935	CUSTOMER ID 940	COMPANION PASSENGERS 945	ORIGINATING CITY 950	DESTINATION CITY 955	CONNECTION RESTRICTIONS 960	LEAVE SATURDAY	ONE STOP	ONE STOP
23456 905	4/20/97	4321	JOHN DOE	12345	MRS. JOHN DOE, JOHN DOE JR.	NEW YORK, NY (JFK)	LOS ANGELES, CA (LAX)				
23457 910	4/21/97	2648	JAMES SMITH	45231	ANN SMITH	NEW YORK, NY (JFK)	CHICAGO, IL (MDW/ORD)				
23457-CO1	4/21/97	2648	JAMES SMITH	45231	ANN SMITH	NEW YORK, NY (JFK)	CHICAGO,IL (MDW/ORD)				

FIG. 9a

CPO DATABASE 900

DATES OF DEPARTURE 965	DATES OF RETURN 970	NUMBER OF PASSENGERS TRAVELING 975	OTHER RESTRICTIONS 985	STATUS 990	PASSENGER NAME RECORD NUMBER 995
4/12/97-4/14/97	4/29/97-4/30/97	3		ACCEPTED	33333
4/22/97	4/30/97	2	N/A	PENDING	
4/22/97	4/30/97	2	N/A	PENDING	

PRICE PER TICKET 980
$547.01
$188.00
$200.00

FIG. 9b

SECURED AIRLINE RULES DATABASE 1000

	RULE NUMBER 1010	ORIGINATING CITY 1012	DESTINATION CITY 1014	CONNECTION RESTRICTIONS 1016	FLIGHT NUMBERS 1018	DATE(S) OF DEPTARTURE 1020	TIME(S) OF DEPARTURE 1022	DEPARTURE DAY OF WEEK 1024
1002	45685	NEWARK, NJ (EWR)	ORLANDO, FL (MCO)	N/A	N/A	10/1/97-10/31/97	N/A	TUES-THURS
1004	45687	NEW YORK, NY (JFK)	CHICAGO, IL (ORD)	THRU CLEVELAND OR PITTSBURG	N/A	4/1/97-5/31/97	11AM-2PM	TUES.

DATE(S) OF RETURN 1026	TIMES OF RETURN 1030	RETURN DAY OF WEEK 1032	NUMBER OF PASSENGERS TRAVELING 1034	LENGTH OF HAUL 1036	YIELD ($1/MILE) 1038	MINIMUM PRICE 1040	INVENTORY RESTRICTIONS OR AVAILABILITY 1042	ADVANCE PURCHASE REQUIREMENTS 1044
10/1/97-10/31/97	N/A	TUES.-THURS.	AT LEAST 2	N/A	N/A	$165.00	K INVENTORY ONLY	WITHIN 21 DAYS OF FLIGHT
4/1/97-5/31/97	11AM-2PM	MON.-THURS.	2	N/A	N/A	$150.00	Q OR K INVENTORY ONLY	7-21 DAYS PRIOR TO FLIGHT

FIG. 10a

SECURED AIRLINE RULES DATABASE- INVENTORY 1050

RULE NUMBER 1060	AIRLINE 1062	FLIGHT NO. 1064	DATE(S) 1066	NUMBER OF SEATS AVAILABLE 1068
234566	AMERICAN	249X	4/29/97	14
234567	AMERICAN	1209	5/1/97	25
234568	AMERICAN	808	5/1/97	7
1052	1054		1056	

FIG. 10b

SECURED AIRLINES RULES DATABASE- PRICING

1075

AIRLINE 1088	ORIGINATING CITY 1090	DESTINATION CITY 1092	DATE(S) 1093	MINIMUM PRICE 1096
AMERICAN	CLEVELAND, OH (CLE)	NEW YORK, NY (JFK)	5/2/97-5/13/97	$75
AMERICAN	CLEVELAND, OH (CLE)	LOS ANGELES, CA (LAX)	5/1/97-5/13/97	$260
AMERICAN	NEW YORK, NY (JFK)	CHICAGO, IL (ORD)	5/1/97-5/31/97	$182

1080 1082 1084

FIG. 10c

COUNTER OFFER RULES DATABASE 1100

RULE NUMBER 1120	DATE(S) OF DEPARTURE 1125	TIME(S) OF DEPARTURE 1130	DATE(S) OF RETURN 1135	TIME(S) OF RETURN 1140
45687	WITHIN 1 DAY	WITHIN 2 HOURS	WITHIN 1 DAY	WITHIN 2 HOURS

NUMBER OF PASSENGERS TRAVELLING 1145	LENGTH OF HAUL 1150	YIELD 1155	MINIMUM PRICE 1160	ADVANCE PURCHASE REQUIREMENTS 1165
AT LEAST 2	N/A	N/A	WITHIN 10%	WITHIN 2 DAYS

110 111

FIG. 11

SECURED AIRLINE AUDIT DATABASE 1200

CPO NUMBER 1220	ANSWER RESPONSE 1225	DATE 1230	TIME 1235	PASSENGER NAME RECORD NUMBER 1240	TICKET BOOKED 1245
2345	YES	4/5/97	3:40PM	56789	ANOTHER AIRLINE
2346	NO	4/6/97	2:00PM	98765	NO TICKET BOOKED
2347	YES	4/8/97	12:00PM	34567	THIS AIRLINE

1205 1210 1215

FIG. 12

PRICING AND RESTRICTIONS DATABASE 1300

FLIGHT 1325	DATE 1330	INVENTORY K PRICE 1335	INVENTORY K RESTRICTION 1340	INVENTORY Y PRICE 1345	INVENTORY Y RESTRICTION 1350
AL654 1305	4/16/97	$50.00	7 DAY RETURN	$40.00	RETURN FRIDAY
DB120 1310	5/12/97	$75.00	RETURN FRIDAY	$60.00	ONE STOP
124C 1315	6/3/97	$25.00	ONE STOP	$20.00	7 DAY RETURN

FIG. 13

SEAT ALLOCATION DATABASE 1400

FLIGHT NUMBER 1425	DEPARTURE DATE 1430	INVENTORY K SEATS AVAILABLE 1435	INVENTORY Y SEATS AVAILABLE 1440	TOTAL SEATS BOOKED 1445	TOTAL CAPACITY 1450
12345	5/15/97	42	114	144	300
23456	5/15/97	36	200	64	300
34567	5/15/97	58	97	145	300
45678	5/15/97	27	212	61	300
1405	1410	1415	1420		

FIG. 14

FORECAST AND DEMAND ANALYSIS DATABASE 1500

FLIGHT NUMBER 1530	DEPARTURE DATE 1535	ORIGINATING CITY 1540	DESTINATION CITY 1545	OFFERED PRICE 1550	FARE CLASS 1555	ACTUAL QUANTITY SOLD 1560	FORCASTED QUANTITY 1565
1234	3/3/97	NEW YORK (JFK)	LOS ANGELES (LAX)	$349	Y	70	300
1234	3/3/97	NEW YORK (JFK)	LOS ANGELES (LAX)	$339	Y	100	130
1234	3/3/97	NEW YORK (JFK)	LOS ANGELES (LAX)	$329	Y	130	140
1234	3/3/97	NEW YORK (JFK)	LOS ANGELES (LAX)	$409	K	7	20
1234	3/3/97	NEW YORK (JFK)	LOS ANGELES (LAX)	$399	K	40	60
1505	1510	1515	1520	1525			

FIG. 15

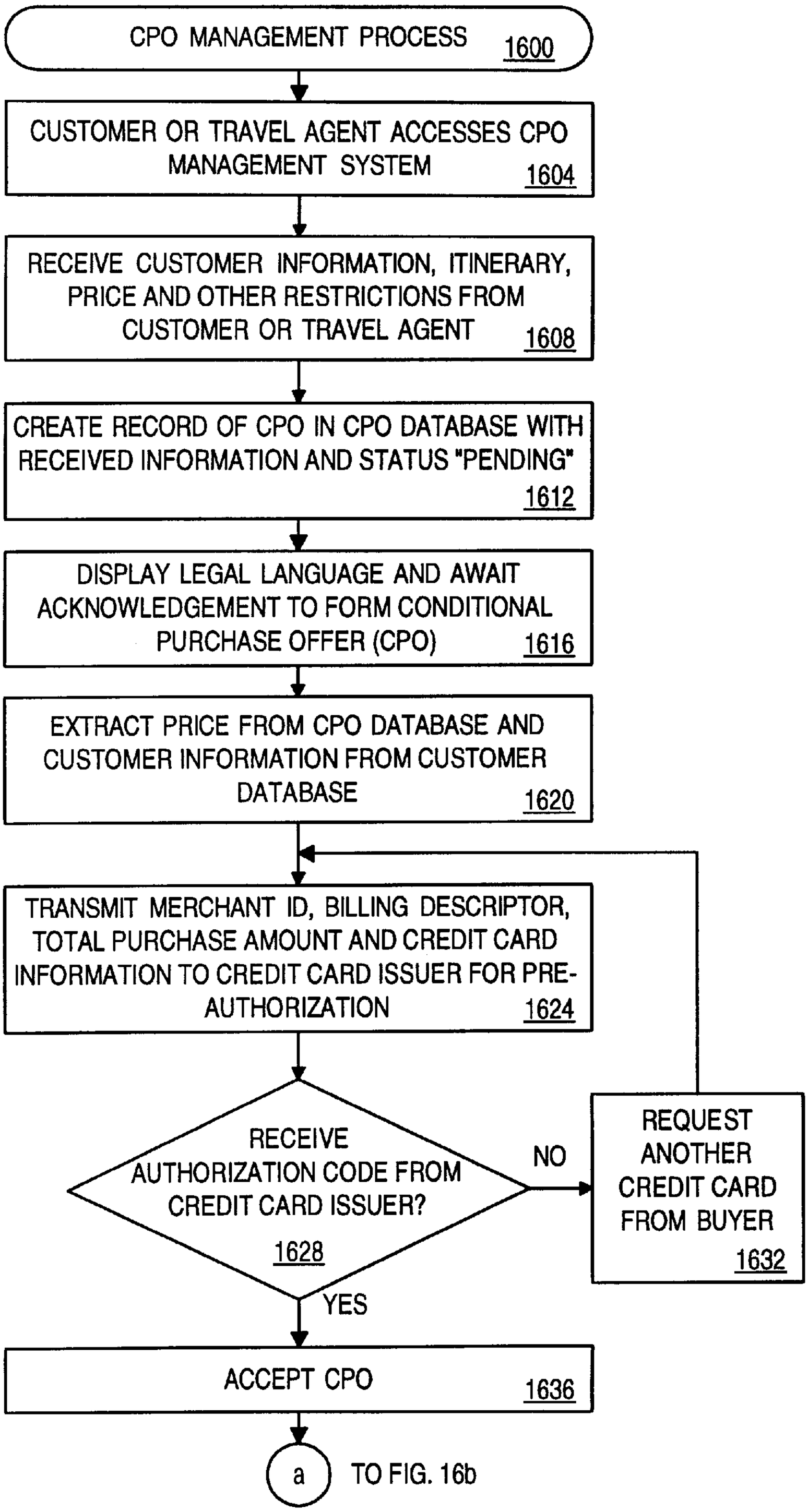

CPO MANAGEMENT PROCESS 1600
CUSTOMER OR TRAVEL AGENT ACCESSES CPO MANAGEMENT SYSTEM 1604
RECEIVE CUSTOMER INFORMATION, ITINERARY, PRICE AND OTHER RESTRICTIONS FROM CUSTOMER OR TRAVEL AGENT 1608
CREATE RECORD OF CPO IN CPO DATABASE WITH RECEIVED INFORMATION AND STATUS "PENDING" 1612
DISPLAY LEGAL LANGUAGE AND AWAIT ACKNOWLEDGEMENT TO FORM CONDITIONAL PURCHASE OFFER (CPO) 1616
EXTRACT PRICE FROM CPO DATABASE AND CUSTOMER INFORMATION FROM CUSTOMER DATABASE 1620
TRANSMIT MERCHANT ID, BILLING DESCRIPTOR, TOTAL PURCHASE AMOUNT AND CREDIT CARD INFORMATION TO CREDIT CARD ISSUER FOR PRE-AUTHORIZATION 1624
RECEIVE AUTHORIZATION CODE FROM CREDIT CARD ISSUER? 1628
NO
REQUEST ANOTHER CREDIT CARD FROM BUYER 1632
YES
ACCEPT CPO 1636
a
TO FIG. 16b

FIG. 16a

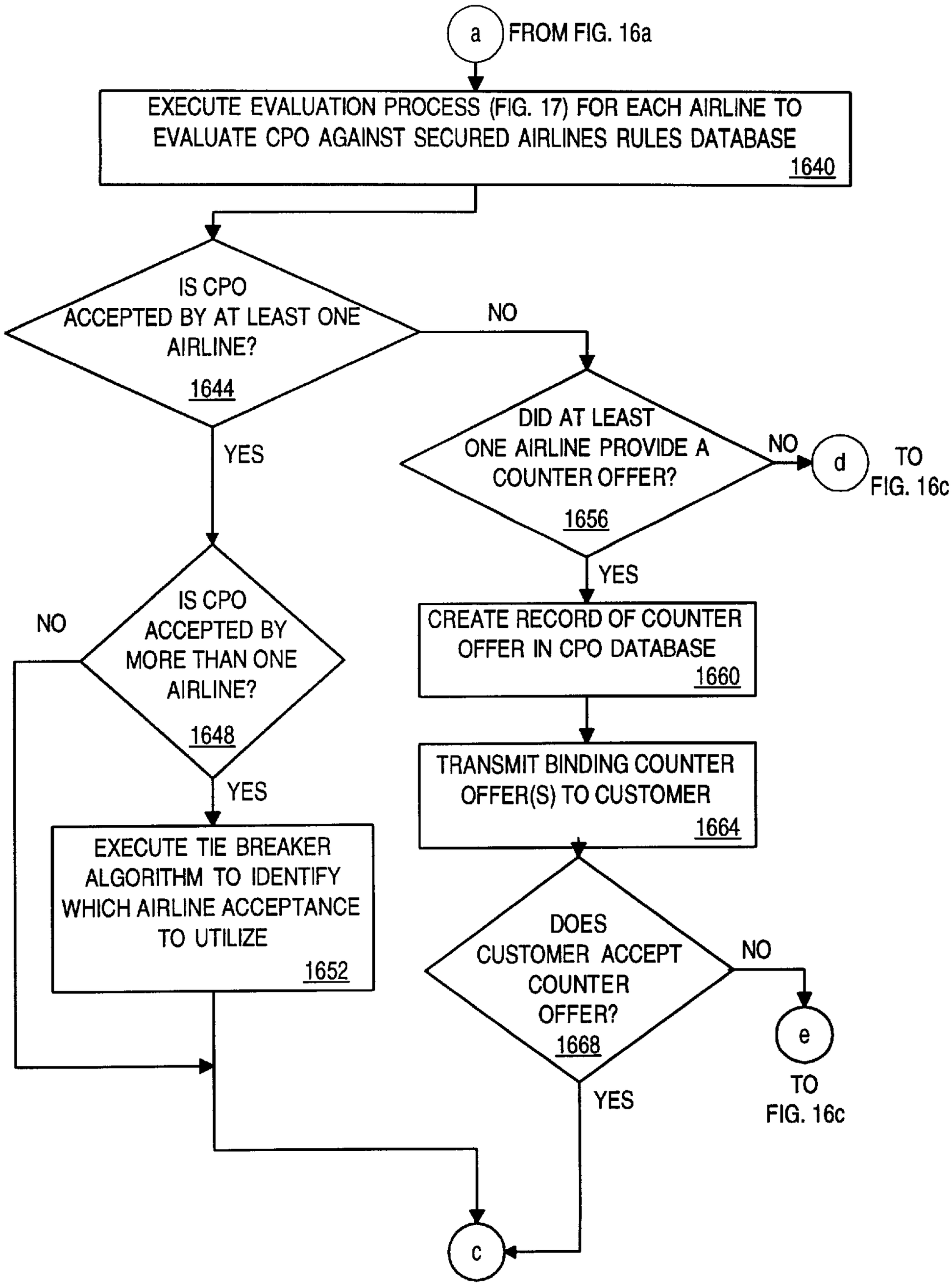

a
FROM FIG. 16a
EXECUTE EVALUATION PROCESS (FIG. 17) FOR EACH AIRLINE TO EVALUATE CPO AGAINST SECURED AIRLINES RULES DATABASE
1640
IS CPO ACCEPTED BY AT LEAST ONE AIRLINE?
1644
NO
YES
DID AT LEAST ONE AIRLINE PROVIDE A COUNTER OFFER?
1656
NO
d
TO FIG. 16c
YES
CREATE RECORD OF COUNTER OFFER IN CPO DATABASE
1660
TRANSMIT BINDING COUNTER OFFER(S) TO CUSTOMER
1664
DOES CUSTOMER ACCEPT COUNTER OFFER?
1668
NO
e
TO FIG. 16c
YES
IS CPO ACCEPTED BY MORE THAN ONE AIRLINE?
1648
NO
YES
EXECUTE TIE BREAKER ALGORITHM TO IDENTIFY WHICH AIRLINE ACCEPTANCE TO UTILIZE
1652
c
TO FIG. 16c

FIG. 16b

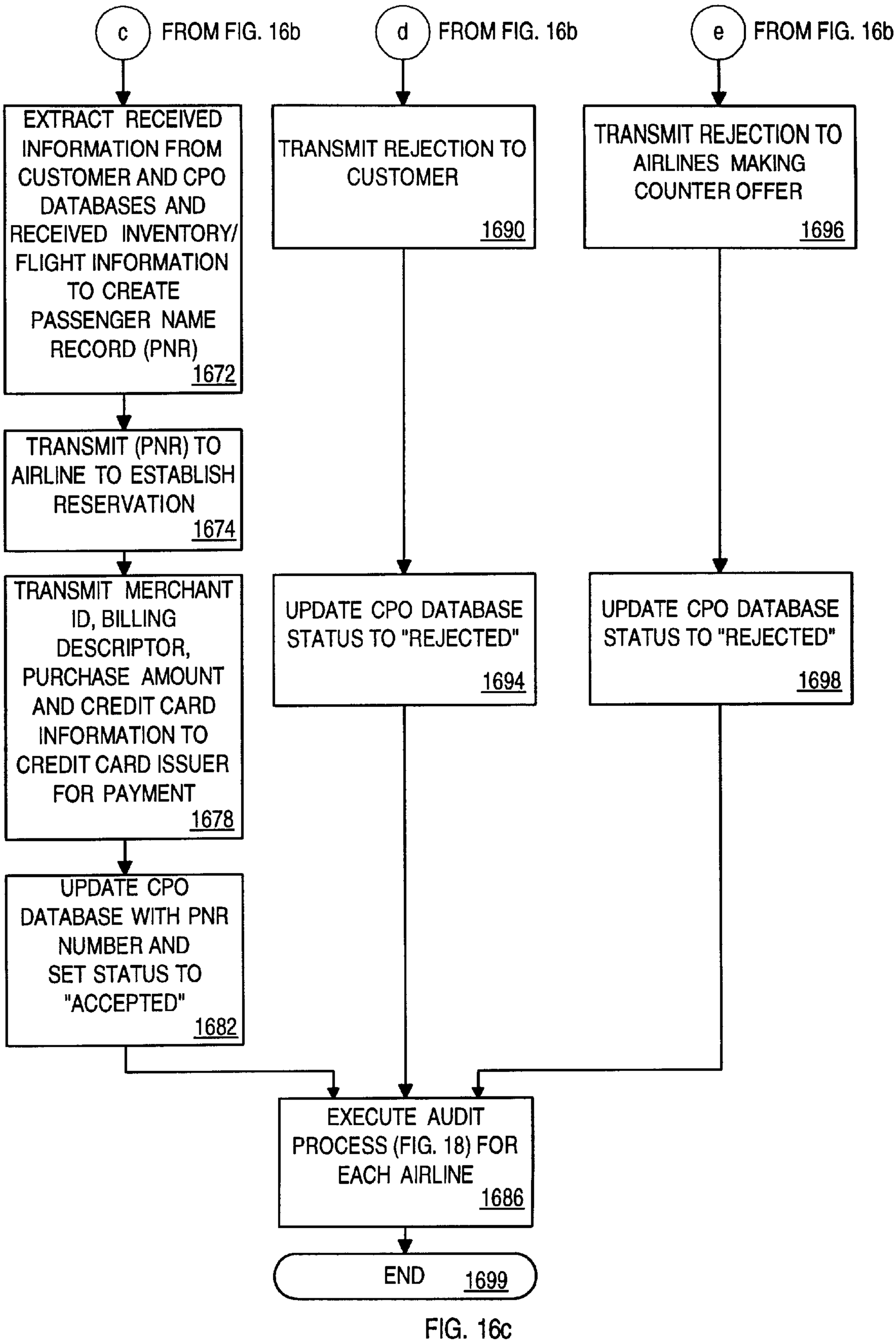

c FROM FIG. 16b
d FROM FIG. 16b
e FROM FIG. 16b
EXTRACT RECEIVED INFORMATION FROM CUSTOMER AND CPO DATABASES AND RECEIVED INVENTORY/ FLIGHT INFORMATION TO CREATE PASSENGER NAME RECORD (PNR) 1672
TRANSMIT (PNR) TO AIRLINE TO ESTABLISH RESERVATION 1674
TRANSMIT MERCHANT ID, BILLING DESCRIPTOR, PURCHASE AMOUNT AND CREDIT CARD INFORMATION TO CREDIT CARD ISSUER FOR PAYMENT 1678
UPDATE CPO DATABASE WITH PNR NUMBER AND SET STATUS TO "ACCEPTED" 1682
TRANSMIT REJECTION TO CUSTOMER 1690
UPDATE CPO DATABASE STATUS TO "REJECTED" 1694
TRANSMIT REJECTION TO AIRLINES MAKING COUNTER OFFER 1696
UPDATE CPO DATABASE STATUS TO "REJECTED" 1698
EXECUTE AUDIT PROCESS (FIG. 18) FOR EACH AIRLINE 1686
END 1699

FIG. 16c

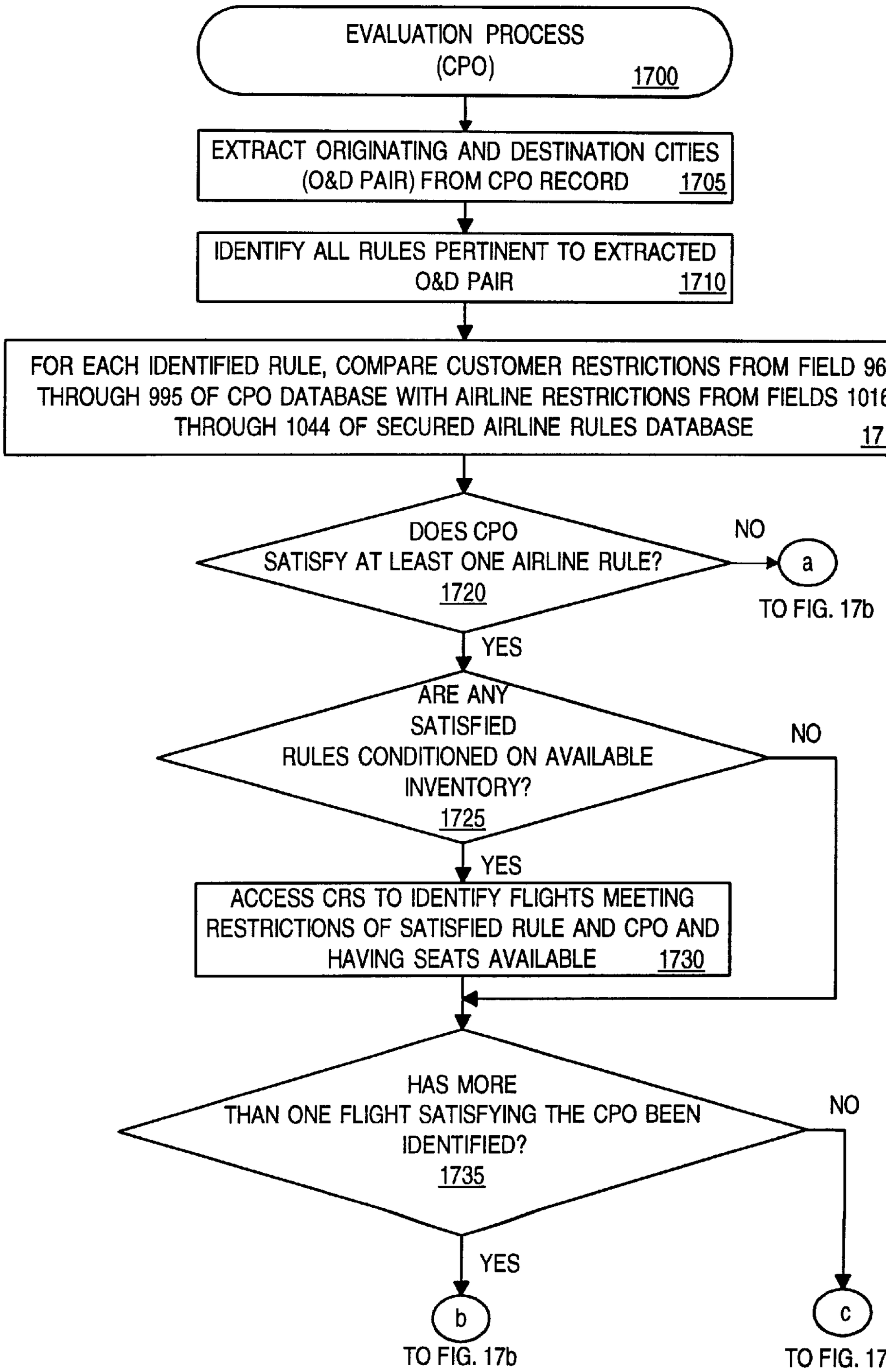

EVALUATION PROCESS (CPO) 1700
EXTRACT ORIGINATING AND DESTINATION CITIES (O&D PAIR) FROM CPO RECORD 1705
IDENTIFY ALL RULES PERTINENT TO EXTRACTED O&D PAIR 1710
FOR EACH IDENTIFIED RULE, COMPARE CUSTOMER RESTRICTIONS FROM FIELD 960 THROUGH 995 OF CPO DATABASE WITH AIRLINE RESTRICTIONS FROM FIELDS 1016 THROUGH 1044 OF SECURED AIRLINE RULES DATABASE 1715
DOES CPO SATISFY AT LEAST ONE AIRLINE RULE? 1720
NO
a
TO FIG. 17b
YES
ARE ANY SATISFIED RULES CONDITIONED ON AVAILABLE INVENTORY? 1725
NO
YES
ACCESS CRS TO IDENTIFY FLIGHTS MEETING RESTRICTIONS OF SATISFIED RULE AND CPO AND HAVING SEATS AVAILABLE 1730
HAS MORE THAN ONE FLIGHT SATISFYING THE CPO BEEN IDENTIFIED? 1735
NO
YES
b
TO FIG. 17b
c
TO FIG. 17b

FIG. 17a

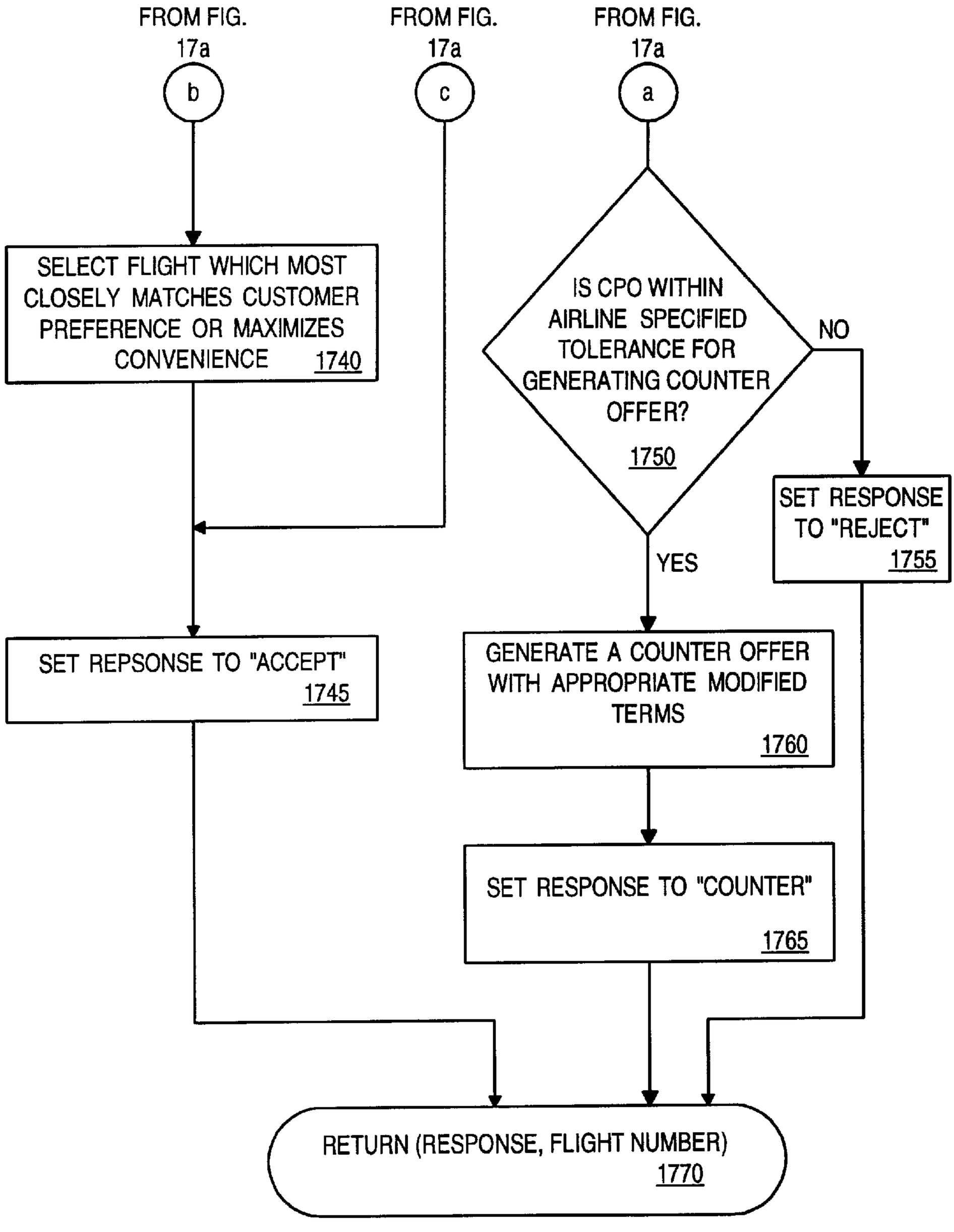

FROM FIG. 17a
b
FROM FIG. 17a
c
FROM FIG. 17a
a
SELECT FLIGHT WHICH MOST CLOSELY MATCHES CUSTOMER PREFERENCE OR MAXIMIZES CONVENIENCE 1740
IS CPO WITHIN AIRLINE SPECIFIED TOLERANCE FOR GENERATING COUNTER OFFER? 1750
NO
YES
SET RESPONSE TO "REJECT" 1755
SET REPSONSE TO "ACCEPT" 1745
GENERATE A COUNTER OFFER WITH APPROPRIATE MODIFIED TERMS 1760
SET RESPONSE TO "COUNTER" 1765
RETURN (RESPONSE, FLIGHT NUMBER) 1770

FIG. 17b

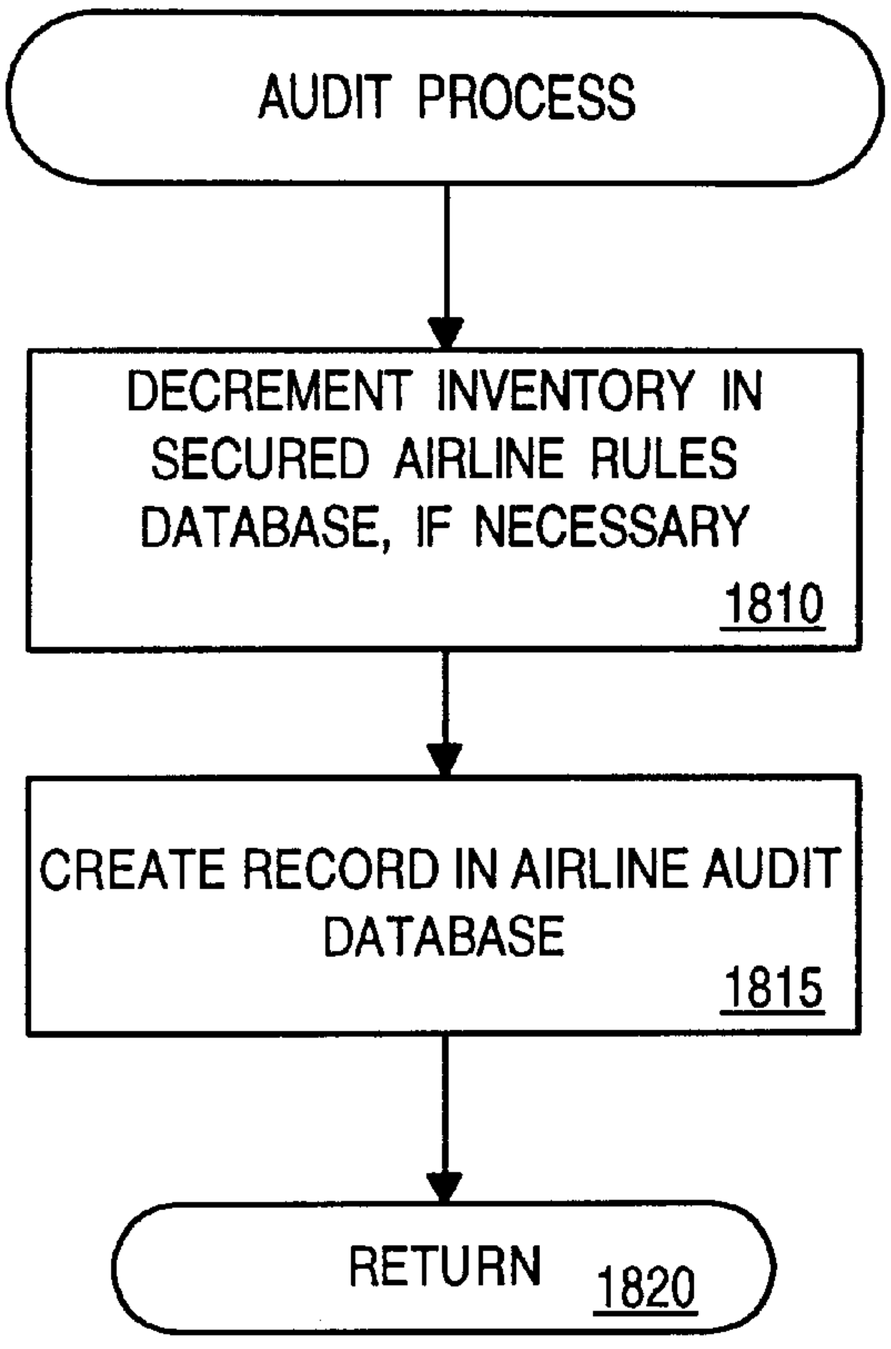

AUDIT PROCESS
DECREMENT INVENTORY IN SECURED AIRLINE RULES DATABASE, IF NECESSARY
1810
CREATE RECORD IN AIRLINE AUDIT DATABASE
1815
RETURN
1820

FIG. 18

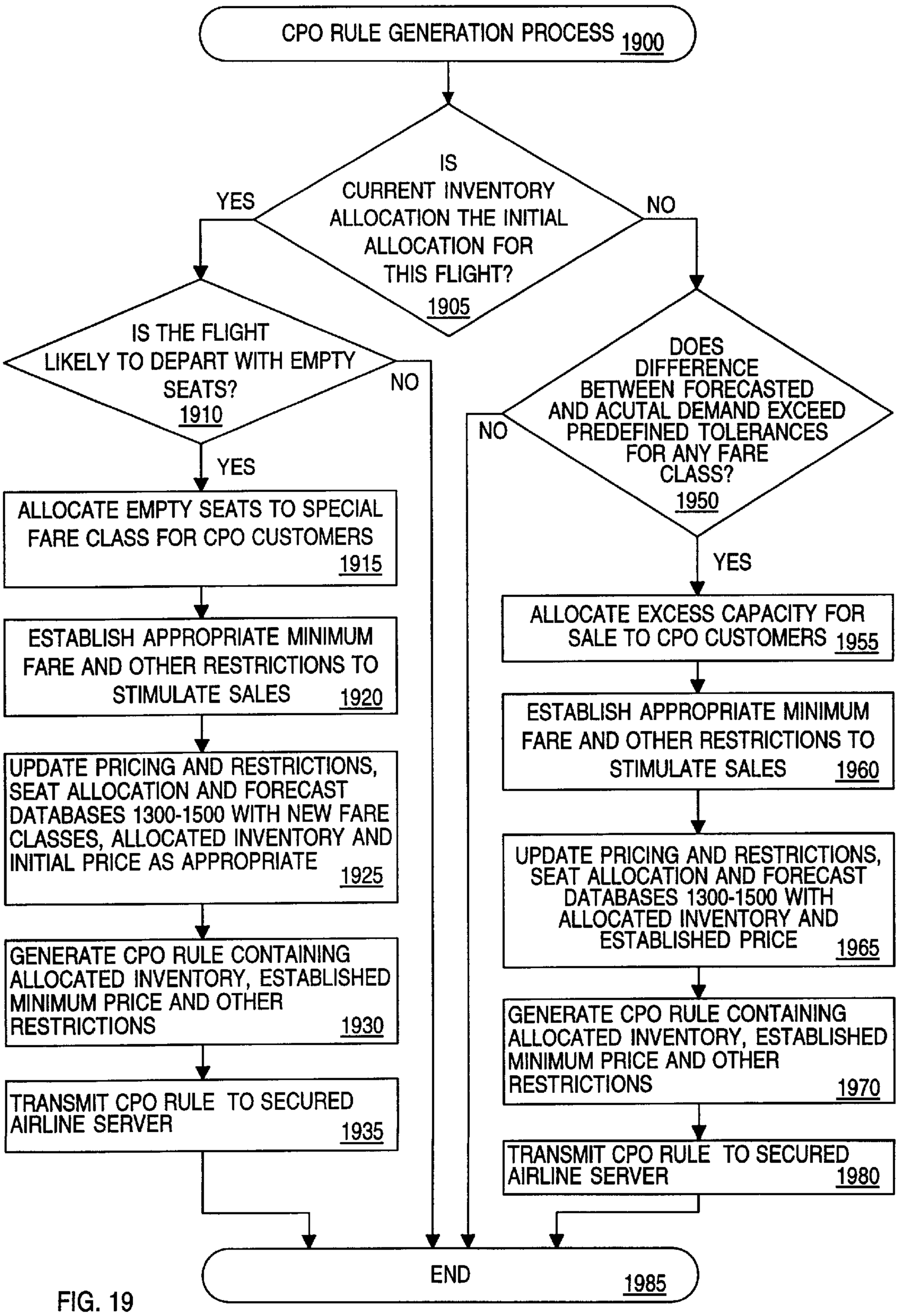

CPO RULE GENERATION PROCESS 1900
IS CURRENT INVENTORY ALLOCATION THE INITIAL ALLOCATION FOR THIS FLIGHT? 1905
YES
NO
IS THE FLIGHT LIKELY TO DEPART WITH EMPTY SEATS? 1910
NO
YES
ALLOCATE EMPTY SEATS TO SPECIAL FARE CLASS FOR CPO CUSTOMERS 1915
ESTABLISH APPROPRIATE MINIMUM FARE AND OTHER RESTRICTIONS TO STIMULATE SALES 1920
UPDATE PRICING AND RESTRICTIONS, SEAT ALLOCATION AND FORECAST DATABASES 1300-1500 WITH NEW FARE CLASSES, ALLOCATED INVENTORY AND INITIAL PRICE AS APPROPRIATE 1925
GENERATE CPO RULE CONTAINING ALLOCATED INVENTORY, ESTABLISHED MINIMUM PRICE AND OTHER RESTRICTIONS 1930
TRANSMIT CPO RULE TO SECURED AIRLINE SERVER 1935
DOES DIFFERENCE BETWEEN FORECASTED AND ACUTAL DEMAND EXCEED PREDEFINED TOLERANCES FOR ANY FARE CLASS? 1950
NO
YES
ALLOCATE EXCESS CAPACITY FOR SALE TO CPO CUSTOMERS 1955
ESTABLISH APPROPRIATE MINIMUM FARE AND OTHER RESTRICTIONS TO STIMULATE SALES 1960
UPDATE PRICING AND RESTRICTIONS, SEAT ALLOCATION AND FORECAST DATABASES 1300-1500 WITH ALLOCATED INVENTORY AND ESTABLISHED PRICE 1965
GENERATE CPO RULE CONTAINING ALLOCATED INVENTORY, ESTABLISHED MINIMUM PRICE AND OTHER RESTRICTIONS 1970
TRANSMIT CPO RULE TO SECURED AIRLINE SERVER 1980
END 1985

FIG. 19

CPO DATABASE 2000

CPO NUMBER 2020	DATE 2025	TRAVEL AGENT NUMBER 2030	PRIMARY PASSENGER NAME 2035	CUSTOMER ID 2040	COMPANION PASSENGERS 2045	ORIGINATING PORT 2050	DESTINATION PORT 2055	RESTRICTIONS 2060
23456	4/20/97	4321	JOHN DOE	12345	MRS. JOHN DOE, JOHN DOE JR.	ST. THOMAS, USVI	NO CHOICE	DO NOT WANT TO LEAVE U.S. TERRITORY
23457	4/21/97	2648	JAMES SMITH	45231	ANN SMITH	MIAMI, FL	NO CHOICE	WANT TO SEE BRITISH VIRGIN ISLANDS
23458	4/21/97	2648	JAMES SMITH	45231	ANN SMITH	CANCUN, MEXICO	NO CHOICE	NO RESTRICTIONS

2005 2010

FIG. 20a

CPO DATABASE (CONTINUED)

DATES OF DEPARTURE 2065	DATES OF RETURN 2070	NUMBER OF PASSENGERS TRAVELING 2075	PRICE PER TICKET 2080	OTHER RESTRICTIONS 2085	STATUS 2090
4/12/97-4/14/97	4/29/97-4/30/97	3	$600.00	LUXURY SIZE CABIN	ACCEPTED
4/22/97	4/30/97	2	$700.00	N/A	PENDING
4/22/97	4/30/97	2	$800.00	LATE DINING/ KING CABIN	PENDING

FIG. 20b

SECURED RULES DATABASE 2100

RULE NUMBER 2110	ORIGINATING PORT 2112	DEPARTURE DAY OF WEEK 2124	CRUISE NUMBERS 2118	DATE(S) OF DEPTARTURE 2120	TIME(S) OF DEPARTURE 2122
45685 (2102)	ST. THOMAS	TUES-THURS	N/A	10/1/97-10/31/97	N/A
45687 (2104)	ST. THOMAS	TUES.	N/A	4/1/97-5/31/97	11AM-2PM

DATE(S) OF RETURN 2126	TIMES OF RETURN 2130	RETURN DAY OF WEEK 2132	NUMBER OF PASSENGERS TRAVELING 2134	LENGTH OF HAUL 2136	YIELD/ MILE/ CABIN 2138	MINIMUM PRICE 2140	INVENTORY RESTRICTIONS OR AVAILABILITY 2142	ADVANCE PURCHASE REQUIREMENTS 2144
10/1/97-10/31/97	N/A	TUES.-THURS.	AT LEAST 2	N/A	1.2	$529	LUXURY N/A	2 MONTHS
4/1/97-5/31/97	11AM-2PM	MON.-THURS.	2	N/A	1.2	$630	ALL AVAILABLE	1 MONTH

FIG. 21

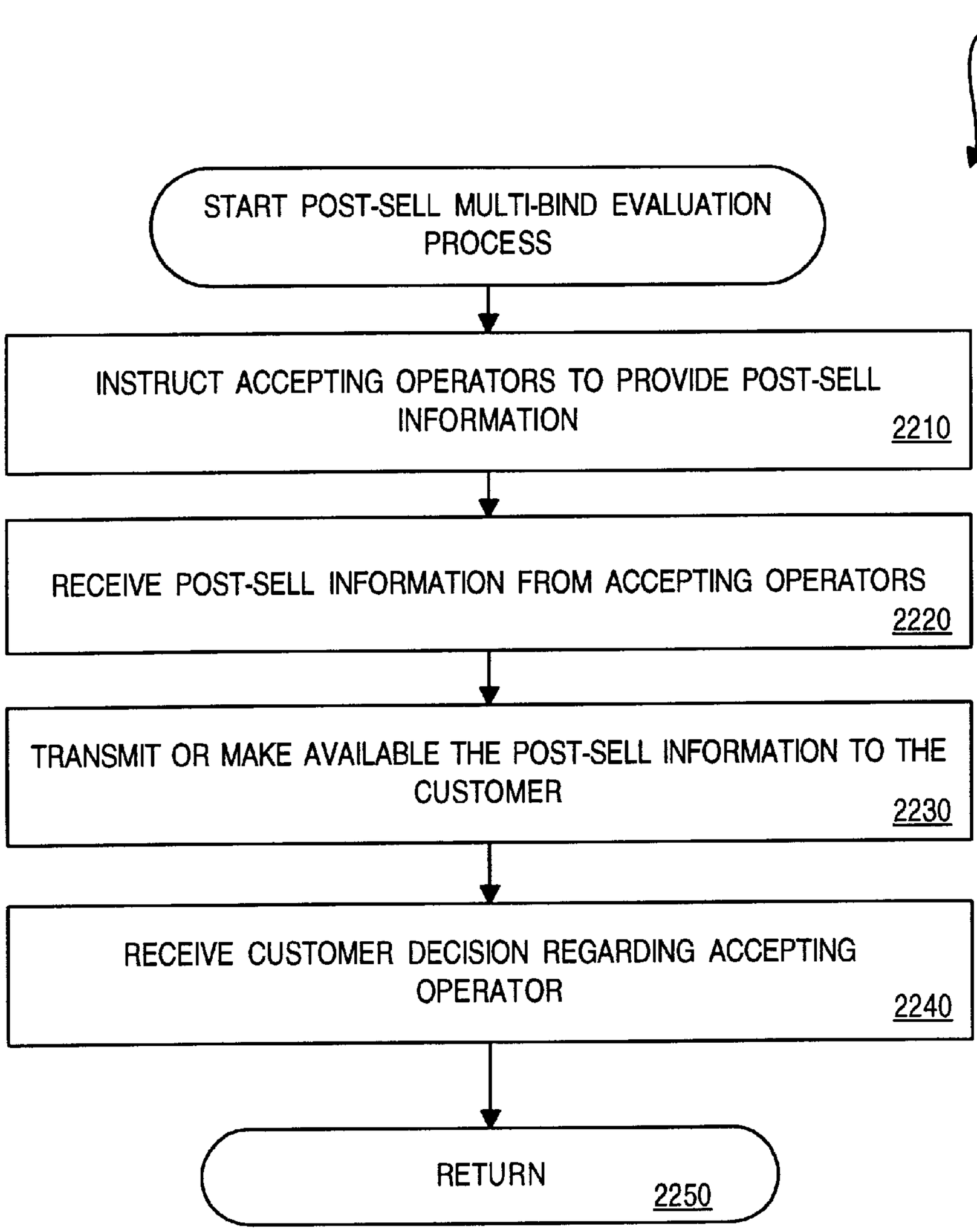

2200
START POST-SELL MULTI-BIND EVALUATION PROCESS
INSTRUCT ACCEPTING OPERATORS TO PROVIDE POST-SELL INFORMATION
2210
RECEIVE POST-SELL INFORMATION FROM ACCEPTING OPERATORS
2220
TRANSMIT OR MAKE AVAILABLE THE POST-SELL INFORMATION TO THE CUSTOMER
2230
RECEIVE CUSTOMER DECISION REGARDING ACCEPTING OPERATOR
2240
RETURN
2250

FIG. 22

EXCLUDED CPO OPERATOR
OFFER DATABASE 2300

OFFER NUMBER 2325	CPO NUMBER 2330	CUSTOMER ID 2335	OPERATOR 2340	TERMS 2345	STATUS 2350
120a	1234	423	CARNIVAL	$600	REJECTED
120b	1234	423	PRINCESS	$600	REJECTED
120c	1234	423	ROYAL CARIBBEAN	$575	ACCEPTED
2305	2310	2315			

FIG. 23

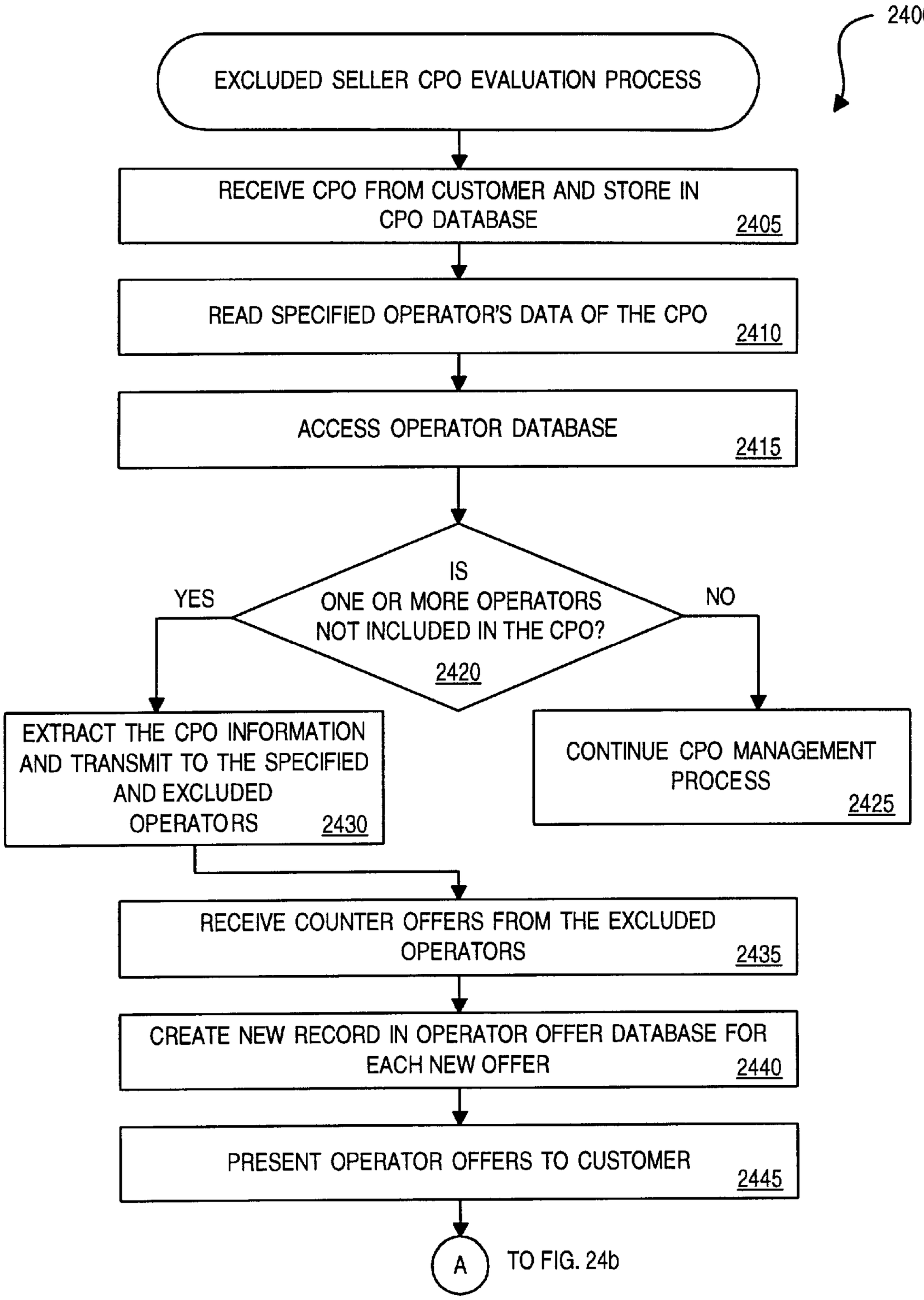

2400
EXCLUDED SELLER CPO EVALUATION PROCESS
RECEIVE CPO FROM CUSTOMER AND STORE IN CPO DATABASE 2405
READ SPECIFIED OPERATOR'S DATA OF THE CPO 2410
ACCESS OPERATOR DATABASE 2415
IS ONE OR MORE OPERATORS NOT INCLUDED IN THE CPO? 2420
YES
NO
EXTRACT THE CPO INFORMATION AND TRANSMIT TO THE SPECIFIED AND EXCLUDED OPERATORS 2430
CONTINUE CPO MANAGEMENT PROCESS 2425
RECEIVE COUNTER OFFERS FROM THE EXCLUDED OPERATORS 2435
CREATE NEW RECORD IN OPERATOR OFFER DATABASE FOR EACH NEW OFFER 2440
PRESENT OPERATOR OFFERS TO CUSTOMER 2445
A
TO FIG. 24b

FIG. 24a

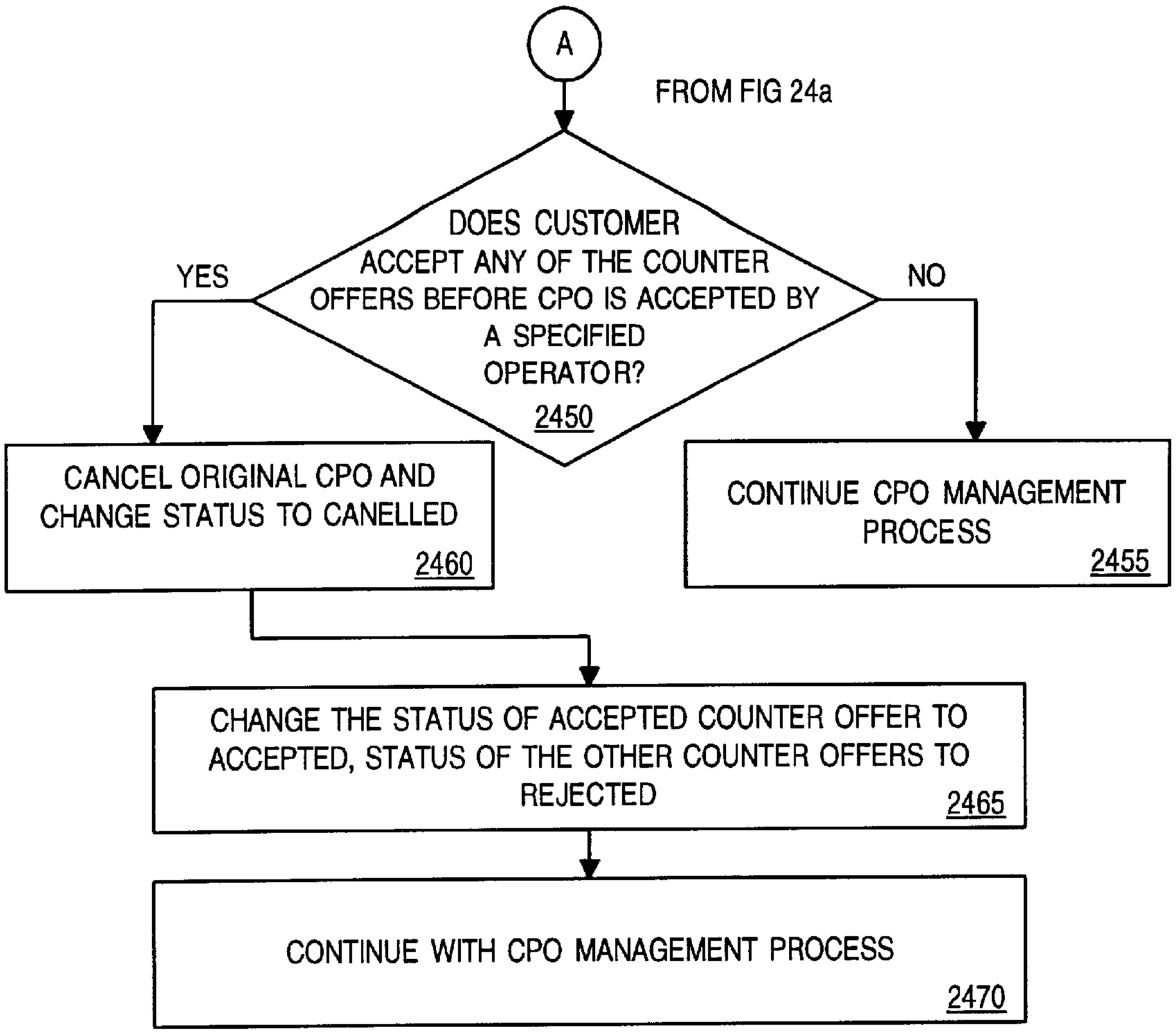

A
FROM FIG 24a
DOES CUSTOMER ACCEPT ANY OF THE COUNTER OFFERS BEFORE CPO IS ACCEPTED BY A SPECIFIED OPERATOR?
2450
YES
NO
CANCEL ORIGINAL CPO AND CHANGE STATUS TO CANELLED
2460
CONTINUE CPO MANAGEMENT PROCESS
2455
CHANGE THE STATUS OF ACCEPTED COUNTER OFFER TO ACCEPTED, STATUS OF THE OTHER COUNTER OFFERS TO REJECTED
2465
CONTINUE WITH CPO MANAGEMENT PROCESS
2470

FIG. 24b

CONDITIONAL PURCHASE OFFER MANAGEMENT SYSTEM FOR CRUISES

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 08/889,319, filed Jul. 8, 1997, which is a continuation-in-part of U.S. patent application Ser. No. 08/707,660, filed Sep. 4, 1996 now U.S. Pat. No. 5,794,207, each incorporated by reference herein.

The present invention is related to the following United States Patent Applications filed contemporaneously herewith: "Conditional Purchase Offer Management System for Packages," U.S. patent application Ser. No. 08/923,683 (Attorney Docket No. WD2-97-065); "Conditional Purchase Offer Management System for Telephone Calls," U.S. patent application Ser. No. 08/923,317 (Attorney Docket No. WD2-97-028); "Conditional Purchase Offer Management System for Event Tickets," U.S. patent application Ser. No. 08/923,530 (Attorney Docket No. WD2-96-081); and "Conditional Purchase Offer and Third-Party Input Management System," U.S. patent application Ser. No. 08/923,524 (Attorney Docket No. WD2-97-067), each assigned to the assignee of the present invention and incorporated by reference herein.

FIELD OF THE INVENTION

The present invention relates generally to a system for processing the sale of goods and services, such as cruise trips and, more particularly, to a method and system for managing the sale of such goods and services by a seller, such as a cruise operator, to customers who have submitted an offer for the purchase of such items.

BACKGROUND OF THE INVENTION

Recently, the cruise industry has experienced explosive growth. In 1981, for example, the worldwide cruise capacity consisted of 41,000 berths, and experienced a seventy percent (70%) load factor. By 1996, worldwide capacity rose to over 100,000 berths, and the load factor increased substantially to eighty seven percent (87%). The growth of the cruise industry is expected to continue into the next century, with approximately 10,000 to 15,000 berths added annually. With the announced addition of new ships and new cruise operators, there will be a substantial increase in worldwide cruise capacity. It is anticipated, however, that capacity may substantially outpace projected passenger volumes. Such excess capacity is expected to reduce load factors and put extraordinary pressures on pricing.

In order to deal with such pricing and inventory challenges, cruise operators and other travel-related sellers have developed sophisticated revenue management systems (RMSs) to optimize revenue. Generally, when a cruise berth is first added to a cruise operator's schedule, the cruise operator's revenue management system attempts to maximize revenue for the berth by establishing a plurality of fare classes and then allocating the number of cabins and price assigned to each fare class. The revenue management system will thereafter continue to monitor the actual demand within each fare class relative to forecasted demand, dynamically reevaluating the inventory allocation and pricing of each fare class for a given berth. In this manner, the cruise operators attempt to obtain maximum revenue from each sailing of a given ship.

While conventional revenue management systems employ sophisticated tools to anticipate future travel, forecasting errors invariably lead to unanticipated excess capacity. In addition, a cruise operator can utilize its revenue management system to forecast its anticipated excess capacity on a given berth associated with cabins that are predicted to be empty. Furthermore, unexpected external events, such as a price war or extreme weather conditions, can also affect a cruise operator's excess capacity. Thus, in an attempt to reduce such excess capacity, cruise operators periodically reevaluate the inventory allocation and pricing of each fare class for a given berth. A cruise operator cannot simply discount the published fares for such unsold cabins, however, without compromising its own underlying fare structure (i.e., without also reducing its prices for higher-fare travelers). Thus, there is currently no effective way for cruise operators to dispose of such excess capacity.

Currently, cruise operators, much like airlines, attempt to sell excess capacity utilizing consolidators, who traditionally sell cruise tickets at a discount. Since the terms of the relationship between the cruise operators and the consolidators are generally not berth specific and are typically defined months in advance, the sale of tickets through a consolidator does not provide a sufficiently dynamic mechanism for cruise operators to sell such excess capacity when actual demand fails to meet forecasted demand. Even assuming that the cruise operators could release the tickets for sale through the consolidators at the last minute, there is currently no effective way for the consolidators to announce the availability and price of such tickets to customers.

Cruise operators recognize that there is a large source of latent demand associated with leisure travelers who are willing to travel at a favorable price. There is currently no effective way, however, for a cruise operator to receive an offer from a customer for leisure travel at a particular price set by the customer, below the cruise operator's published fare. In particular, there is no effective way for the cruise operator to be confident that if the cruise operator accepts the customer's offer, the customer will book the ticket without using the information to ascertain the cruise operator's underlying level of price flexibility, which, if known to a cruise operator's competitors or customers, could dramatically impact the cruise operator's overall revenue structure.

As apparent from the above deficiencies with conventional systems for selling goods and services, such as cruise tickets, a need exists for a system that permits a cruise operator to sell excess capacity when actual demand fails to meet forecasted demand. A further need exists for a buyer-driven system that permits a cruise operator to sell tickets to leisure travelers at a price set by the customer, typically below the cruise operator's published fare. Yet another need exists for a system that permits sellers to stimulate sales of excess inventory, without compromising the seller's published price structure. Another need exists for a system that permits sellers to capture and process consumer demand for each selling price of a given item, such as a given fare class on each cruise berth.

SUMMARY OF THE INVENTION

Generally, according to one aspect of the invention, a conditional purchase offer (CPO) management system is disclosed for receiving conditional purchase offers from one or more customers and for evaluating the received CPOs to determine whether any seller, such as an airline or cruise operator, is willing to accept a given CPO. A CPO is a binding offer containing one or more conditions submitted by a customer for the purchase of a product, such as a good or service, including airline or cruise travel, at a customer-defined price.

In one embodiment, the CPOs are evaluated against a number of CPO rules defined by a plurality of sellers to determine whether such sellers are willing to accept the CPO. A CPO rule is a set of restrictions defined by a given seller, to define a combination of restrictions for which the seller is willing to accept a predefined minimum price. The CPO rules are utilized by the CPO management system to render a decision to either accept, reject or counter a CPO on behalf of a particular seller. The CPO rules may be generated by the revenue management system (RMS) of the respective seller by evaluating current inventory, pricing and revenue information, as well as historical patterns, to forecast future demand.

The CPO management system preferably includes a CPO management central server and one or more secured servers. Each secured server may be associated with one or more sellers and each server stores, among other things, the CPO rules defined by any associated sellers. Each secured server may be remotely located from the CPO management central server, or may be integrated with the CPO management central server. In one remote embodiment, the secured server associated with one or more sellers may be physically located at a processing facility secured by the particular seller. The CPO rules may be securely stored by each server, to prevent one seller from accessing, obtaining or altering the CPO rules of another seller.

Once the terms of the CPO have been received by the CPO management system, the CPO management central server will determine whether one or more sellers will accept the received CPO. Thereafter, the customer is notified of the response of the sellers to the CPO. If a seller accepts the CPO, or if the customer accepts a counteroffer from a seller, a ticket is then booked by the CPO management system with the appropriate restrictions.

In one embodiment, if a CPO is accepted by more than one airline, cruise operator or other seller, the CPO management system executes a post-sell multi-bind process to permit each accepting seller to directly market to the customer and post-sell their product. Thus, the customer still selects for himself which airline or cruise operator acceptance to utilize, based on materials or incentives furnished by each seller. The customer is bound by the CPO management system, in accordance with the terms of the CPO, and is obligated to purchase the goods or services specified by the CPO, but the buyer may decide which seller to utilize, based on materials or incentives provided to the customer directly by each accepting seller.

A CPO submitted by a customer can specify one or more preferred sellers. Thus, the CPO management system provides the CPO to each specified seller to determine if one or more of the sellers are willing to accept the CPO. In a supplemental embodiment, the CPO management system preferably executes an excluded seller CPO evaluation process to provide the CPO to the excluded sellers who may make counteroffers to the customer, in an attempt to obtain the business, before one of the specified sellers accepts the CPO. The CPO can be provided to the excluded sellers before, or contemporaneously with, the preferred sellers. In this manner, the CPO management system can sell the rights to receive CPO information to excluded sellers or collect a larger percentage for any counteroffers that are accepted by a customer.

A more complete understanding of the present invention, as well as further features and advantages of the present invention, will be obtained by reference to the following detailed description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic block diagram illustrating a conditional purchase offer (CPO) management system in accordance with one embodiment of the present invention;

FIG. **2** is a schematic block diagram of the exemplary CPO management central server of FIG. **1**;

FIG. **3** is a schematic block diagram of the exemplary secured airline server of FIG. **1**;

FIG. **4** is a schematic block diagram of the exemplary central reservation system of FIG. **1**;

FIG. **5***a* is a schematic block diagram of the exemplary reservation management system (RMS) of FIG. **1**;

FIG. **5***b* illustrates the interaction between the RMS, the airline reservation system and the various databases depicted in FIG. **5***a*, during a conventional pricing and allocation process and the CPO rules generation process of FIG. **19**;

FIG. **5***c* illustrates the actual demand over time for airline tickets within a given fare class, relative to forecasted demand;

FIG. **6** illustrates a sample table from the customer database of FIG. **2**;

FIG. **7** illustrates a sample table from the airline database of FIG. **2**;

FIG. **8** illustrates a sample table from the flight schedule database of FIGS. **2** and **4**;

FIGS. **9***a* and **9***b*, collectively, illustrate a sample table from the CPO database of FIG. **2**;

FIG. **10***a* illustrates a sample table from the secured airlines rules database of FIG. **3**;

FIGS. **10***b* and **10***c*, collectively, illustrate alternative sample tables to the secured airlines rules database of FIG. **3**;

FIG. **11** illustrates a sample table from the counteroffer rules database of FIG. **3**;

FIG. **12** illustrates a sample table from the secured airline audit database of FIG. **3**;

FIG. **13** illustrates a sample table from the pricing and restrictions database of FIGS. **4** and **5***a;*

FIG. **14** illustrates a sample table from the seat allocation database of FIGS. **4** and **5***a;*

FIG. **15** illustrates a sample table from the forecast and demand analysis database of FIG. **5***a;*

FIGS. **16***a* through **16***c*, collectively, are a flow chart describing an exemplary CPO management process implemented by the CPO management central server of FIG. **2**;

FIGS. **17***a* and **17***b*, collectively, are a flowchart describing an exemplary evaluation process implemented by the secured airline server of FIG. **3**;

FIG. **18** is a flow chart describing an exemplary audit process implemented by the secured airline server of FIG. **3**;

FIG. **19** is a flow chart describing an exemplary CPO rule generation process implemented by the revenue management system of FIG. **5***a;*

FIGS. **20***a* and **20***b*, collectively, illustrate an alternative sample table from the CPO database of FIG. **2** for a cruise implementation;

FIG. **21** illustrates an alternative sample table from the secured rules database of FIG. **3** for a cruise implementation;

FIG. **22** is a flow chart describing an exemplary post-sell multi-bind process which may be implemented by the CPO management central server of FIG. **2**;

FIG. **23** illustrates a sample table from the excluded operator counteroffer database which may be implemented

by the CPO management central server of FIG. **2** in conjunction with the flow chart of FIGS. **24***a* and **24***b*; and

FIGS. **24***a* and **24***b*, collectively, are a flow chart describing an exemplary excluded seller CPO evaluation process which may be implemented by the CPO management central server of FIG. **2**.

DETAILED DESCRIPTION

FIG. **1** shows a conditional purchase offer (CPO) management system **100** for receiving conditional purchase offers from one or more customers or travel agents **110**, hereinafter referred to as customer **110**, and for evaluating the received CPOs against a number of CPO rules defined by a plurality of sellers, such as airlines **120**, **130** or cruise operators (not shown), to determine whether any seller is willing to accept a given CPO. As discussed further below, if a seller accepts a given CPO, the CPO management system **100** binds the customer **110** on behalf of the accepting seller **130**, to form a legally binding contract.

As used herein, a CPO is a binding offer containing one or more conditions submitted by a customer **110** for the purchase of an item, such as air travel, at a customer-defined price. In the illustrative airline embodiment, the customer-defined conditions would include itinerary parameters, such as the origin and destination cities; acceptable dates and times of departure and return; and whether connecting flights or stopovers are acceptable to the customer. In addition, the parameters of a CPO may allow a customer to specify one or more preferred airline(s), flights, seat assignments, seat class, aircraft type, refund/change rules, or maximum layover time. In a cruise embodiment, the customer-defined conditions would also include itinerary parameters, such as the origin and destination cities; acceptable dates and times of departure and return; as well as one or more preferred cruise operators, ship type, cabin class, and dining preference.

As discussed further below, a CPO rule is a set of restrictions defined by a given seller, such as an airline, to define a combination of such restrictions for which the seller is willing to accept a predefined minimum price. In a preferred embodiment, the CPO rules are generated by the revenue management system **500** of the respective airline or cruise operator. In alternate embodiments, the CPO rules may be generated by a yield management system, a profit management system, or any system that controls and manages inventory.

As discussed more fully below in conjunction with FIGS. **5***b* and **19**, the revenue management system **500** will employ a CPO rules generation process **1900** to generate CPO rules by evaluating current inventory, pricing and revenue information, as well as historical patterns and external events, to forecast future travel. Thereafter, the CPO rules are utilized by the CPO management system **100** to render a decision to either accept, reject or counter a CPO on behalf of a particular airline or cruise operator. According to a feature of the present invention, the CPO rules are dynamic in nature and may be updated by a given airline or other seller, as necessary.

For example, a CPO rule for a given airline can specify that the airline will accept any CPO for travel between Newark, N.J. (EWR) and Orlando, Fla. (MCO) during the month of October, 1997, provided that (i) the customer travels between Tuesday and Thursday, (ii) the tickets are booked within 21 days of departure, (iii) the price is at least $165 per ticket, (iv) K-class inventory is available on all flight segments of the customer's itinerary, and (v) there are at least two (2) passengers travelling together.

Although the CPO management system **100** is illustrated herein as a system for selling airline or cruise tickets, the CPO management system **100** could be utilized to sell any good or service product, such as automobiles, insurance, computer equipment, or hotel accommodations, as would be apparent to a person of ordinary skill. For a more detailed discussion of a general CPO management system for selling such items, see U.S. patent application Ser. No. 08/707,660, filed Sep. 4, 1996, the parent application to the present invention, which is incorporated by reference herein. It is noted that in such alternate embodiments, the revenue management system **500**, discussed below in conjunction with FIGS. **5***a* through **5***c*, may be embodied as an inventory management system or any other system utilized by the seller to establish pricing and inventory information for the respective item.

CPO MANAGEMENT SYSTEM

As shown in FIG. **1**, the CPO management system **100** preferably includes a CPO management central server **200** and one or more secured airline servers **300**. As discussed further below in conjunction with FIG. **3**, each secured airline server **300** may be associated with one or more airlines or cruise operators and each server **300** stores, among other things, the CPO rules defined by any associated sellers, such as the airline **120**. Each secured airline server **300** may be remotely located from the CPO management central server **200**, as shown in FIG. **1**, or may be integrated with the CPO management central server **200**. In one remote embodiment, the secured airline server **300** associated with each airline or cruise operator may be physically located at a processing facility secured by the particular airline or cruise operator, or at the physical location of a third party. In this manner, the airline or cruise operator can evaluate CPO rules independently.

The particular location of the secured airline servers **300** will dictate the nature of the information that is transmitted between the airlines **120**, **130** or cruise operators (not shown) and the CPO management system **100**, as would be apparent to a person of ordinary skill. For example, if the secured airline servers **300** are integrated with the CPO management central server **200**, or are otherwise remotely located from the respective airlines **120**, **130** or cruise operators (not shown), then the respective airline **120**, **130** or cruise operator will transmit the CPO rules to the location of the airline's associated secured airline server **300** for storage of the CPO rules and application of the CPO rules against each received CPO. Likewise, if the secured airline servers **300** are physically located at the processing facility secured by the associated airline or cruise operator, then the CPO management central server **200** will transmit the CPOs to each airline or cruise operator for processing and the airlines or cruise operator will return the response for each CPO to the CPO management central server **200**. Thus, the CPO management system **100** can determine if one or more sellers accepts a given CPO by providing the CPO to each seller and receiving an acceptance or rejection, or by applying the CPO to the CPO rules to render a decision to either accept, reject or counter a CPO on behalf of a particular seller.

The CPO rules contain sensitive information, including price flexibility and available capacity, which, if known to a seller's competitors or customers, could dramatically impact the seller's overall revenue structure. Thus, according to a feature of the present invention, the CPO rules are preferably securely stored by each airline server **300**, if necessary, to prevent one seller, such as airline **120**, from accessing,

obtaining or altering the CPO rules of another seller, such as airline **130**. In one embodiment, the secured airline servers **300** utilize computer security techniques, such as database access control mechanisms. In this manner, the integrity and confidentiality of the CPO rules are maintained in the potentially hostile computing environment.

In addition, according to a further feature of the invention, the CPO management system **100** prevents customers **110** from submitting multiple CPOs containing a progressively increasing price in order to identify the seller's defined minimum price for a given flight or berth. For example, if the CPO will be binding upon the customer **110** if accepted by any airline **120** or cruise operator, the customer **100** will be discouraged from "pinging" the CPO management system **100** to identify the seller's underlying price flexibility. In addition, the CPO management system **100** can limit the number of CPOs that any customer **110** can submit within a predefined time period.

In alternate embodiments, the customer or travel agent **110** can be charged a fee or a penalty if a ticket is not booked when at least one airline has accepted the CPO or the CPO management system **100** can evaluate a rating of said customer **110** containing information regarding the likelihood that said customer **110** will book a ticket corresponding to said CPO. For a more detailed description of a suitable rating system, see U.S. patent application Ser. No. 08/811,349, filed Mar. 4, 1997, entitled AIRLINE PRICE INQUIRY METHOD AND SYSTEM, assigned to the assignee of the present invention and incorporated by reference herein. In one embodiment, the evaluated rating comprises a ratio of bookings to purchase offers by the customer **110**. In this manner, the airline or cruise operator can be confident that if the seller accepts the customer's offer, the customer will book the ticket without using the information to ascertain the seller's underlying level of price flexibility. The particular location of a given secured airline server **300** may also impact the level of security measures that the associated airline(s) or cruise operator(s) may desire for the sensitive CPO rules. For example, if a given secured airline server **300** is dedicated to a single airline and is physically located at a processing facility secured by the associated airline, then the respective airline may implement its own minimal security measures to control the processing of each CPO against its own CPO rules, if desired, and thereby maintain the integrity and confidentiality of the price-sensitive information incorporated into the CPO rules. If, however, a given secured airline server **300** stores the CPO rules for a plurality of airlines or cruise operators and is remotely located from such airlines or cruise operators, then the importance of implementing computer security and database access control mechanisms may be increased, as would be apparent to a person of ordinary skill.

As discussed further below, each customer **110** contacts the CPO management system **100**, for example, by means of telephone, facsimile, online access, e-mail, in-person contact or through a travel agent, and provides the CPO management system **100** with the terms of their CPO. It is noted that each customer **110** may employ a general-purpose computer for communicating with the CPO management system **100**. The general-purpose computer of each customer **110** is preferably comprised of a processing unit, a modem, memory means and any software required to communicate with the CPO management system **100**.

Once the terms of the CPO have been received by the CPO management system **100**, the CPO management central server **200** will execute a CPO management process **1600**, discussed below in conjunction with FIGS. **16***a* through **16***c*, to compare the received CPO against the CPO rules of each airline or cruise operator. As a result of this comparison, the CPO is either accepted, rejected or countered. Thereafter, the customer **110** is notified of the response of the airlines or cruise operators to the CPO. If a seller accepts the CPO, or if the customer **110** accepts a counteroffer from a seller, a ticket is then booked by the CPO management system **100** with the appropriate restrictions which meet the conditions defined by the customer **110**.

According to a further feature of the present invention, the minimum requirements of a CPO are designed to discourage utilization of this system by business travelers or last minute travelers who are typically willing to pay full-fare. For example, business travelers will be discouraged if the CPO rules require a Saturday night stay or significant flexibility by the customer **110** on the time of both the departure and return portions of the customer's itinerary. In this manner, business travelers, who are typically unwilling to lose up to a full day at either end of their trip, will be discouraged from purchasing such discounted tickets. Thus, the present invention permits airlines to fill otherwise empty seats in a manner that stimulates latent and unfulfilled leisure travel demand while leaving underlying fare structures of the airlines **120**, **130** intact.

Likewise, in embodiments where the CPO management system is utilized for the sale of any item, the minimum requirements of a CPO are preferably designed to discourage utilization of this system by customers who are typically willing to pay the full retail price. For example, when selling fashion items, CPO customers can be required to purchase fashions from the previous season. Similarly, the CPO rules can be designed to require the purchase of multiple quantities of a given item, and thereby discourage use by consumers looking for one item, who are more likely to pay the full retail price.

In a preferred embodiment, the CPO management system **100** may optionally access a central reservation system (CRS) **400**, discussed below in conjunction with FIG. **4**, to perform itinerary queries that will identify particular flights or berths which satisfy a given itinerary, and to make reservations. The central reservation system (CRS) **400** may be embodied, for example, as an existing conventional reservation system, such as Apollo, Sabre, System One or Worldspan.

In addition, the CPO management system **100** could alternatively access the proprietary reservation systems (ARSs) **150** of each airline or cruise operator to perform such itinerary queries and to make reservations with the respective airline or cruise operator. The airline reservation systems (ARSs) **150** maintained by each airline **120**, are each essentially a subset of the central CRS **400**. Thus, in view of the overlapping functions and capabilities of the CRS **400** and the proprietary reservation systems **150** of each airline or cruise operator, the CPO management system **100** could access any of such systems to obtain required information, and the terms "CRS" and "ARS" are used interchangeably herein.

As shown in FIG. **1**, each airline **120**, **130** or cruise operator (not shown), also has a revenue management system (RMS) **500**, discussed further below in conjunction with FIGS. **5***a* through **5***c*. The RMS **500** may be embodied as a conventional RMS, as modified herein to generate CPO rules and to otherwise allocate and price airline or cruise tickets for sale to CPO customers.

Generally, the revenue management systems (RMSs) **500** are utilized to optimize revenue per flight or berth, in a

known manner. An RMS performs seat or cabin inventory control by periodically adjusting nested booking limits ("buckets") for the various fare classes, in order to optimize the passenger mix and thereby maximize the generated revenue.

The CPO management system **100**, customer **110**, airlines **120**, **130**, cruise operators (not shown) and central reservation system **400** (collectively, the "nodes") preferably transmit digitally encoded data and other information between one another. The communication links between the nodes preferably comprise a cable, fiber or wireless link on which electronic signals can propagate. For example, each node may be connected via an Internet connection using a public switched telephone network (PSTN), such as those provided by a local or regional telephone operating company. Alternatively, each node may be connected by dedicated data lines, cellular, Personal Communication Systems ("PCS"), microwave, or satellite networks.

FIG. **2** is a block diagram showing the architecture of an illustrative CPO management central server **200**. The CPO management central server **200** preferably includes certain standard hardware components, such as a central processing unit (CPU) **205**, a random access memory (RAM) **210**, a read only memory (ROM) **220**, a clock **225**, a data storage device **230**, and communications ports **240**, **250**, **260**. The CPU **205** is preferably linked to each of the other listed elements, either by means of a shared data bus, or dedicated connections, as shown in FIG. **2**.

The CPU **205** may be embodied as a single commercially available processor, such as Intel's Pentium 100 MHz P54C microprocessor, Motorola's 120 MHz PowerPC **604** microprocessor or Sun Microsystem's 166 MHz UltraSPARC-I microprocessor. Alternatively, the CPU **205** may be embodied as a number of such processors operating in parallel.

The ROM **220** and/or data storage device **230** are operable to store one or more instructions, discussed further below in conjunction with FIG. **16**, which the CPU **205** is operable to retrieve, interpret and execute. For example, the ROM **220** and/or data storage device **230** preferably store processes to accomplish the transfer of required payments, charges and debits, between the airlines **120**, **130** and customers **110**. In particular, as discussed below in conjunction with FIG. **16***c*, the CPO management process **1600** preferably transmits the credit card information associated with a given customer **110** to the credit card issuer for payment, if a ticket is actually issued to the customer **110**. The processing of such accounting transactions are preferably secured in a conventional manner, for example, using well-known cryptographic techniques.

The CPU **205** preferably includes a control unit, an arithmetic logic unit (ALU), and a CPU local memory storage device, such as, for example, a stackable cache or a plurality of registers, in a known manner. The control unit is operable to retrieve instructions from the data storage device **230** or ROM **220**. The ALU is operable to perform a plurality of operations needed to carry out instructions. The CPU local memory storage device is operable to provide high-speed storage used for storing temporary results and control information.

As discussed further below in conjunction with FIGS. **6** through **9**, respectively, the data storage device **230** includes a customer database **600**, an airline database **700**, a flight schedule database **800**, and a CPO database **900**. The customer database **600** preferably stores information on each customer of the CPO management system **100**, including biographical information and billing information, such as a credit card number. The airline database **700** preferably stores information on each airline which is registered with the CPO management system **100** to sell airline tickets to CPO customers, including address and contact information. The flight schedule database **800** preferably stores specific flight information for each O & D Pair. Finally, the CPO database **900** preferably contains a record of each CPO being processed by the CPO management system **100**, including the terms of the CPO and the associated status.

In addition, the data storage device **230** includes a CPO management process **1600**, discussed further below in conjunction with FIG. **16**. Generally, the CPO management process **1600** receives each CPO from a customer **110**, compares the CPO against the CPO rules of each airline **120**, **130**, and determines whether to accept, reject or counter the CPO on behalf of an airline.

The communications port **240** connects the CPO management central server **200** to the central reservation system (CRS) **400** and the proprietary reservation systems (ARSs) **150** maintained by each airline **120**, **130**. The communications port **250** connects the CPO management central server **200** to individual customers and travel agents, such as the customer **110**, for example, by means of an Internet connection using the public switched telephone network (PSTN). The communications port **260** connects the CPO management central server **200** to any remote secured airline servers **300**. The communications ports **240**, **250**, **260** each preferably include multiple communication channels for simultaneously establishing a plurality of connections. It is noted that although the CPO management central server **200** is illustrated as having three separate communication ports **240**, **250**, **260**, the CPO management central server **200** could alternatively be implemented with a single connection to an Ethernet network, which in turn provides the central server **200** with a connection to the various nodes.

FIG. **3** is a block diagram showing the architecture of an illustrative secured airline server **300**. As previously indicated, the CPO management system **100** may utilize one or more secured airline servers **300**, each supporting one or more airlines **120**, **130**. Each secured airline server **300** preferably includes certain standard hardware components, such as a central processing unit (CPU) **305**, a random access memory (RAM) **310**, a read only memory (ROM) **320**, a clock **325**, a data storage device **330**, and communications ports **340**, **345**. Each of these components may be identical to those described above in conjunction with FIG. **2**.

As previously indicated, in one embodiment, the CPO rules may be stored in a secure database to maintain the integrity and confidentiality of the highly sensitive information included in each CPO rule. Thus, the secured airline server **300** preferably uses a secure database, such as the products commercially available from Oracle, Informix or IBM.

As discussed further below in conjunction with FIGS. **10** through **12**, respectively, the data storage device **330** includes a secured airline rules database **1000**, a counteroffer rules database **1100**, and a secured airline audit database **1200**. The secured airline rules database **1000** preferably maintains the CPO rules for the one or more airlines associated with the secured airline server **300**. The counteroffer rules database **1100** is preferably stored by each secured airline server **300** to maintain a set of tolerances which may be utilized by the CPO management system **100** to generate a counteroffer to a CPO on behalf of an airline, if the CPO is within predefined tolerances of one or more

restrictions associated with a given CPO rule. As previously indicated, the secured airline rules database **1000** and the counteroffer rules database **1100** may be stored in an encrypted format to maintain the integrity and confidentiality of the highly sensitive information included in the CPO rules. The secured airline audit database **1200** preferably maintains an audit trail for each CPO that is processed by the CPO management system **100**.

In addition, the data storage device **330** includes an evaluation process **1700** and an audit process **1800**, discussed further below in conjunction with FIGS. **17** and **18**, respectively. Generally, the evaluation process **1700** is a subroutine executed by the CPO management process **1600**, which receives a CPO and compares the CPO against the rules of one airline, such as the airline **120**, to generate a response on behalf of the airline to the given CPO. The audit process **1800** is a subroutine executed by the CPO management process **1600** to maintain an audit trail for each CPO that is processed by the CPO management system **100**.

The communications port **340** connects the secured airline server **300** to the CPO management central server **200**. The communications port **345** connects the secured airline server **300** to the associated airlines(s) **120**. The communications ports **340**, **345** preferably include multiple communication channels for simultaneously establishing a plurality of connections.

CENTRAL RESERVATION SYSTEM

FIG. **4** is a block diagram showing the architecture of an illustrative central reservation system (CRS) server **400**. The CRS **400** preferably includes certain standard hardware components, such as a central processing unit (CPU) **405**, a random access memory (RAM) **410**, a read only memory (ROM) **420**, a clock **425**, a data storage device **430**, and a communications port **440**. Each of these components may be identical to those described above in conjunction with FIG. **2**.

The ROM **420** and/or data storage device **430** are operable to store one or more instructions, for processing (1) flight information received from the airlines; (2) itinerary inquiries regarding flight availability; and (3) ticket bookings, in a known manner, which the CPU **405** is operable to retrieve, interpret and execute.

As discussed further below in conjunction with FIGS. **8**, **13** and **14**, respectively, the data storage device **430** includes a flight schedule database **800**, a pricing and restrictions database **1300**, and a seat allocation database **1400**. As previously indicated, the flight schedule database **800** contains essentially the same flight information as the database of the same name which is stored by the CPO management central server **200**, namely, specific flight information for each O & D Pair. The pricing and restrictions database **1300** maintains pricing information and related restrictions for each fare class on a given flight offered by the airlines **120**, **130**. The seat allocation database **1400** maintains available inventory information for each fare class on a given flight offered by the airlines **120**, **130**.

The communications port **440** connects the CRS **400** to the CPO management central server **200** and to each airline, such as the airlines **120**, **130**. The CRS **400** preferably includes an electronic mail processor **450** for processing and storing e-mail messages transmitted between the CRS **400** and the various customers **110**, airlines **120**, **130** and the CPO management system **100**.

REVENUE MANAGEMENT SYSTEM

FIG. **5***a* is a block diagram showing the architecture of an illustrative revenue management system (RMS) **500**, as maintained by each airline, such as the airline **120**. As previously indicated, the RMS **500** may be embodied as a conventional RMS, such as an RMS commercially available from Sabre Decision Technologies, as modified herein to generate CPO rules and to otherwise allocate and price airline tickets for sale to CPO customers. In this manner, the RMS **500** makes a portion of the inventory of an airline **120** available for sale to CPO customers **110**. It is noted that the RMS for many airlines performs only the function of inventory allocation and does not incorporate a pricing function. In such cases, a separate system, such as a manual process, is utilized to price inventory that has been allocated by the RMS. In the illustrative embodiment disclosed herein, the RMS **500** performs both the inventory allocation and pricing functions.

The RMS **500** preferably includes certain standard hardware components, such as a central processing unit (CPU) **505**, a random access memory (RAM) **510**, a read only memory (ROM) **520**, a clock **525**, a data storage device **530**, and a communications port **540**. Each of these components may be identical to those described above in conjunction with FIG. **2**.

The ROM **520** and/or data storage device **530** are operable to store one or more instructions, for analyzing current seating inventory and revenue, as well as historical patterns, to allocate and price available seat inventory in an effort to maximize revenue for the airline, which the CPU **405** is operable to retrieve, interpret and execute.

As discussed further below in conjunction with FIGS. **13** through **15**, respectively, the data storage device **530** includes a pricing and restrictions database **1300**, and a seat allocation database **1400**, which each contain essentially the same information as the databases of the same name stored by the CRS **400**, as well as a forecast and demand analysis database **1500**. As previously indicated, the pricing and restrictions database **1300** maintains pricing information and related restrictions for each fare class on a given flight offered by the associated airline **120**, and the seat allocation database **1400** maintains available inventory information for each fare class on a given flight offered by the associated airline **120**. The forecast and demand analysis database **1500** contains information on each selling price for each fare class for a given flight, and the forecasted demand at each selling price as established by the RMS **500**. In addition, the data storage device **530** preferably includes a CPO rules generation process **1900**, discussed below in conjunction with FIG. **19**, to generate CPO rules by evaluating current inventory, pricing and revenue information, as well as historical patterns, to forecast future travel.

The communications port **540** connects each RMS **500** to the CRS **400** and the CPO management system **100**.

FIG. **5***b* illustrates the manner in which the RMS **500** utilizes a number of databases and other tools in implementing a conventional pricing and allocation process and the CPO rules generation process **1900**. The particular format and content of the illustrative databases shown in FIG. **5***b* are discussed in detail below in conjunction with FIGS. **13** through **15**. It is noted that the conventional pricing and allocation process and the CPO rules generation process **1900** may be executed by the RMS **500** initially when a flight is first added to the flight schedule, and then periodically to reallocate and price available inventory in response to demand and external events.

Thus, when a flight is first added to the flight schedule of an airline **120**, a record of the flight is preferably created by the airline reservation system **150** in the flight schedule

database **800** with the appropriate itinerary information. In addition, the RMS **500** will perform a conventional pricing and allocation process in conjunction with the CPO rules generation process **1900**, shown in FIG. **19**, to initially populate the respective fields of the pricing and restrictions database **1300**, seat allocation database **1400**, and forecast and demand analysis database **1500** for the flight, as shown in FIG. **5***b*.

Generally, during the initial pricing and allocation process for a given flight, the RMS **500** attempts to maximize revenue by establishing a plurality of fare classes and allocating the number of seats and price assigned to each fare class. The initial seat allocation and pricing information is stored in the seat allocation database **1400** and the pricing and restrictions database **1300**, respectively. The initial price for each fare class and the forecasted demand is preferably stored in the forecast and demand analysis database **1500**. In one embodiment, a separate fare class can be established by the RMS **500** for selling tickets to CPO customers. Since tickets to CPO customers are generally sold at a discount, the RMS **500** preferably only initially allocates seats to the CPO fare class which are forecasted to be empty or unlikely to be sold when the flight actually departs. As is well known, an airline can utilize a conventional RMS **500** to predict, based on available historical data, whether or not there will be empty seats on a given flight.

As shown in FIG. **5***b*, the airline reservation system (ARS) **150** will access the established pricing and restrictions database **1300** and seat allocation database **1400** to perform itinerary queries. In addition, as tickets are sold by the airline **120**, the ARS **150** will preferably decrement the available inventory in the seat allocation database **1400**. In this manner, the seat allocation database **1400** maintains an up-to-date representation of the available inventory on each flight.

The RMS **500** will continue to monitor the actual demand **560** within each fare class relative to forecasted demand **570**, as illustrated by FIG. **5***c*, dynamically reevaluating the inventory allocation and pricing of each fare class for a given flight in order to minimize the unanticipated excess inventory delta **580**. The RMS **500** monitors current actual demand information by retrieving detailed inventory data from the seat allocation database **1400** or summary information from the forecast and demand analysis database **1500**. In addition, the RMS **500** will utilize the historical demand information stored in the forecast and demand analysis database **1500** for prior periods, which essentially provides a demand curve for each selling price of a given fare class on each flight. For example, when allocating and pricing inventory for a given flight, the RMS **500** may analyze demand trends for similar flights from previous relevant time periods, in a known manner. It is also noted that conventional RMSs typically respond to competitive forces and other external events, such as price wars or increased demand due to a large event, such as the Olympics, as shown in FIG. **5***b*.

According to a feature of the present invention, an airline **120** can correct for forecasting errors, if necessary, or other competitive forces which have produced unanticipated excess capacity **580**, by releasing tickets for sale to CPO customers. Due to the confidential nature of the CPO rules, and the discouraged use of CPO tickets by full-fare business travelers, the airlines **120**, **130** can sell such excess capacity at a discount, without undermining its existing published fare structure. Thus, in a preferred embodiment, the RMS **500** will periodically execute the CPO rule generation process **1900**, discussed below in conjunction with FIG. **19**, to generate CPO rules that encourage the sale of tickets to CPO customers.

DATABASES

FIG. **6** illustrates an exemplary customer database **600** that preferably stores information on each customer of the CPO management system **100**, including biographical information and billing information, such as a credit card number. The customer database **600** maintains a plurality of records, such as records **605–615**, each associated with a different customer. For each customer name listed in field **640**, the customer database **600** includes the customer's address in field **645** and credit card number in field **655**. In addition, the customer account database **600** preferably includes an identification (ID) number in field **660**. The ID number stored in field **660** may be utilized, for example, to index a historical database (not shown) of previous ticket purchases and CPOs associated with the customer.

FIG. **7** illustrates an exemplary airline database **700** which preferably stores information on each airline which is registered with the CPO management system **100** to sell airline tickets to CPO customers, including address and contact information. The airline database **700** maintains a plurality of records, such as records **705–715**, each associated with a different airline. For each airline name listed in field **740**, the airline database **700** includes address and contact information in fields **745** and **750**, respectively. The contact information may comprise, for example, the name of an individual employee of the airline **120** and a corresponding telephone number, web page URL, bulletin board address, pager number, telephone number, electronic mail address, voice mail address or facsimile number.

In addition, in an embodiment where the CPO rules of a given airline are stored in an encrypted format, the cryptographic key of the associated airline is preferably stored in field **755** of the airline database **700**. Finally, the airline database **700** preferably stores an indication in field **760** of the percentage of CPOs which have been offered to each airline which have actually been accepted by the respective airline. In this manner, the CPO management system **100** can offer a particular CPO to airlines in a sequence that is ranked in accordance with the CPO acceptance rate, as discussed further below in conjunction with FIG. **16***b*. In alternate embodiments, the airline database **700** can incorporate fields to facilitate the processing of CPOs in accordance with sequences based on (i) the amount of inventory made available by each airline for sale to CPO customers, (ii) priorities negotiated by each airline, such as an airline priority over certain routes, or (iii) the highest commission rates paid by the airlines to the CPO management system **100**.

FIG. **8** illustrates an exemplary flight schedule database **800** that preferably stores specific flight information for each O & D Pair, as well as connection information. The flight schedule database **800** maintains a plurality of records, such as records **805–815**, each associated with a different flight. For each O & D Pair listed in fields **840** and **845**, the flight schedule database **800** includes the date of each flight in field **850**, as well as the times of departure and arrival of the respective flight in fields **855** and **860**. The airline and flight number associated with each flight are preferably indicated in fields **865** and **870**, respectively, and any required connections are indicated in field **875**.

FIGS. **9***a* and **9***b* illustrate an exemplary CPO database **900** which preferably contains a record of each CPO being processed by the CPO management system **100**, including

the terms of the CPO and the associated status. The CPO database **900** maintains a plurality of records, such as records **905** and **910**, each associated with a different CPO being processed by the system **100**. For each CPO identified by CPO number in field **920**, the CPO database **900** includes the date the CPO was received in field **925**, and an identification (ID) number for the travel agent, if any, associated with the CPO in field **930**. It is noted that the travel agent ID number stored in field **930** may be utilized, for example, to index a historical database (not shown) of previous ticket purchases and CPOs associated with the travel agent.

In addition, the CPO database **900** identifies the customer by name in field **935**, and by identification number in field **940** and identifies any companion passengers in field **945**. The ID number stored in field **945** is preferably utilized to cross-reference the corresponding information stored for the customer in the customer database **600**.

The parameters of the customer's itinerary and other pertinent restrictions are stored in fields **950** through **995** of the CPO database **900**. Specifically, the origin and destination cities are identified in fields **950** and **955**, respectively, and any connection restrictions specified by the customer **110** are recorded in field **960**. The dates of the customer's departure and return are stored in fields **965** and **970**, respectively. In an alternate embodiment (not shown), the CPO database **900** could also permit the customer **110** to specify particular time-of-day (range) restrictions for the departure and return flights.

The CPO database **900** preferably stores an indication of the total number of passengers traveling together in field **975**, and sets forth the price the customer is willing to pay per ticket in field **980**. Any other miscellaneous restrictions specified by the customer will be recorded in field **985**, such as preferred airline(s), flights, or seat assignments. Field **990** records the current status of the respective CPO, such as pending, accepted, rejected or expired. Finally, if the CPO ultimately results in a ticket being booked for the customer, the passenger name record number (PNR) associated with the ticket is stored in field **995**. Generally, a PNR is a record stored by the CRS **400** containing information for each ticketed passenger, including: record number, passenger name(s), address for ticketing, billing information, such as credit card number, carrier(s) and flight number(s) for all segments, seat assignments, inventory class, aircraft type, airline-issued authorization code for discounted fare, selling price, and additional comments.

As discussed further below, rather than reject a CPO, one or more airlines may issue a binding counteroffer to the CPO, which the customer **110** may accept or reject. If a counteroffer is issued to a customer **110**, then a record of the counteroffer with any associated restrictions, is preferably created in the CPO database **900**. For example, if an airline **120** issues a counteroffer to the CPO number 23456 stored in record **905** of the CPO database **900**, then the status of the initial CPO is changed to "counter", and a further record (not shown) corresponding to the counteroffer may be stored in the CPO database **900** under a modified CPO number indicating the counteroffer, such as CPO number 23456-CO1.

FIG. **10***a* illustrates an exemplary secured airline rules database **1000** which preferably maintains the CPO rules for one or more airlines associated with a particular secured airline server **300**. As previously indicated, the secured airline rules database **1000** may be stored in an encrypted format to maintain the integrity and confidentiality of the highly sensitive information included in the CPO rules. The secured airline rules database **1000** maintains a plurality of records, such as records **1002** and **1004**, each associated with a different CPO rule. For each CPO rule identified by rule number in field **1010**, the secured airline rules database **1000** includes the associated restrictions defined by the respective airline in fields **1012** through **1044**.

According to a feature of the invention, the CPO rules that are processed by the CPO management system **100** may be of varying complexity. The particular restrictions set forth in the illustrative secured airline rules database **1000** are representative of the principles of the invention only. An airline can incorporate a subset of such restrictions and/or incorporate additional restrictions, as would be apparent to a person of ordinary skill. For example, the CPO rules of an airline **120** may also incorporate restrictions on the minimum number of nights associated with the itinerary, or require the customer **110** to have a Saturday night stay.

For illustrative purposes, the secured airline rules database **1000** shown in FIG. **10***a*, allows an airline to create CPO rules by specifying some or all of the following restrictions in fields **1012** through **1044**: origin and destination cities, connection restrictions, flight numbers included or excluded, dates and times of departure, departure days of the week, dates and times of return, return days of the week, number of passengers traveling, length of haul, average yield per seat, minimum price per ticket, inventory restrictions or seat availability, and advance purchase requirements.

For example, record **1002**, shown in FIG. **10***a*, is associated with a CPO rule for a given airline which specifies that the airline will accept any CPO for travel from Newark, N.J. (EWR) to Orlando, Fla. (MCO) during the month of October, 1997, provided that (i) the customer travels on any flight departing on a Tuesday through Thursday, (ii) the tickets are booked within 21 days of departure, (iii) the price is at least $165 per ticket, (iv) K inventory is available on all flight segments of the customer's itinerary and (v) at least two (2) passengers are travelling together.

Similarly, record **1004**, shown in FIG. **10***a*, is associated with a CPO rule for a given airline which specifies that the airline will accept any CPO having a price of at least $150, for two or more people traveling together between New York, N.Y. (JFK) and Chicago, Ill. (ORD) during April or May, 1997 where Q or K inventory is available on any flight between 11 a.m. and 2 p.m., where the flight departs on a Tuesday and returns on a Monday through Thursday, and is booked between 7 and 21 days prior to travel and can be routed through the airline's Cleveland, Ohio or Pittsburgh, Pa. hubs.

In an alternate or supplemental embodiment, the secured airline rules database **1000** can be implemented using a pair of inventory and pricing databases **1050**, **1075**, illustrated in FIGS. **10***b* and **10***c*, respectively. In this embodiment, the CPO rules stored in the inventory database **1050** contain actual inventory on each flight that the airline has released for sale to CPO customers. The inventory database **1050** maintains a plurality of records, such as records **1052–1056**, each associated with a different CPO rule and flight. For each CPO rule identified by rule number in field **1060**, the inventory database **1050** includes an indication of the airline, flight number and dates in fields **1062** through **1066**, respectively. In addition, the number of seats that may be sold by the CPO management system **100** on each flight is indicated in field **1068**. In a preferred embodiment, as inventory is sold by the CPO management system **100**, the available inventory recorded in the inventory database **1050** will be decremented.

The pricing database **1075**, shown in FIG. **10***c*, maintains a plurality of records, such as records **1080–1084**, each associated with a different O & D Pair. For each O & D Pair identified in fields **1090** and **1092**, respectively, the pricing database **1075** includes an indication of the airline, dates and minimum price in fields **1088**, **1093** and **1096**, respectively.

Thus, in such an alternate or supplemental embodiment, prior to accessing the inventory database **1050**, the CPO management system **100** will preferably query the CRS **400** to identify possible flights which satisfy the customer's itinerary restrictions. Thereafter, the CPO management system **100** will access the inventory database **1050** to determine if the airline has released any inventory on such identified flights to the CPO management system **100** for sale to CPO customers. In one embodiment, the list of identified flights from the CRS **400** can be sequenced to optimize customer preferences, and the inventory database **1050** can be searched in the order of the sequenced list of flights, until available inventory is identified. Finally, if any available inventory satisfying the customer's itinerary is identified, then the CPO management system **100** will access the pricing database **1075** shown in FIG. **10***c*, to determine if the price specified by the customer exceeds the minimum price defined by the airline, as set forth in field **1096** of the pricing database **1075**.

FIG. **11** illustrates an exemplary counteroffer rules database **1100** which preferably stores a set of tolerances which may be utilized by the CPO management system **100** to generate a counteroffer to a CPO if the CPO is within predefined tolerances of one or more restrictions associated with a given CPO rule. The counteroffer rules database **1100** maintains a plurality of records, such as records **1105** and **1110**, each associated with a different CPO rule. For each CPO rule identified by rule number in field **1120**, the counteroffer rules database **1100** includes acceptable tolerances on the dates and times of departure and return in fields **1125** through **1140**. In addition, the counteroffer rules database **1100** includes tolerances on the number of passengers traveling, length of haul and yield in fields **1145** through **1155**, respectively. Finally, the counteroffer rules database **1100** records any permissible tolerances on the minimum price and advance purchase requirements in fields **1160** and **1165**, respectively.

As shown in FIG. **11**, the counteroffer rules database **1100** includes counteroffer rule number 45687 in record **1105**, corresponding to CPO rule number 45687 from FIG. **10***a*. As illustrated in FIG. **11**, the CPO management system **100** is authorized to generate a counteroffer on behalf of an airline **120** associated with CPO rule number 45687, if a given CPO fails to meet one or more of the restrictions of CPO rule number 45687, but the restrictions which are not met are within the predefined tolerances set forth in the counteroffer rules database **1100**. For example, if a given CPO includes a customer-defined price of $140.00, but all other airline-defined restrictions of CPO rule number 45687 are met, a counteroffer should be generated containing a price of $150.00 since the price variation is within ten percent (10%) of the minimum price associated with CPO rule number 45687, as authorized by counteroffer rule number 45687.

FIG. **12** illustrates an exemplary secured airline audit database **1200** which preferably maintains an audit trail for each CPO which is processed by the CPO management system **100**. The secured airline audit database **1200** maintains a plurality of records, such as records **1205–1215**, each associated with a different CPO that has been processed by the CPO management system **100**. For each CPO identified by CPO number in field **1220**, the secured airline audit database **1200** includes the response of the respective airline to the CPO in field **1225**, and the date and time of the CPO in fields **1230** and **1235**, respectively. In addition, if a ticket is booked for the customer **110** on any airline, then the secured airline audit database **1200** preferably stores the passenger name record (PNR) number associated with the ticket in field **1240** and an indication of whether or not the ticket was booked on the respective airline in field **1245**. In a preferred embodiment, the entry in field **1245** indicates whether the ticket was booked (a) on the respective airline associated with the database, (b) with another airline or (c) if no ticket was issued at all. In this manner, the CPO management system **100** can establish that a ticket was actually booked for each CPO which was accepted by at least one airline.

FIG. **13** illustrates an exemplary pricing and restrictions database **1300** which maintains pricing information and related restrictions for each flight offered by the airlines **120**, **130**, as established and updated by the RMS **500**. The pricing and restrictions database **1300** includes a plurality of records, such as records **1305–1315**, each associated with a different flight. For each flight identified by flight number in field **1325**, the pricing and restrictions database **1300** includes the date of the flight in field **1330** and the respective price and restrictions associated with each inventory class in fields **1335** through **1350**.

FIG. **14** illustrates an exemplary seat allocation database **1400** which maintains available inventory information for each fare class on a given flight offered by the airlines **120**, **130**, as allocated and updated by the RMS **500**. In addition, as inventory is sold by an airline, the airline's ARS **150** will preferably decrement the available inventory recorded in the seat allocation database **1400**. The seat allocation database **1400** includes a plurality of records, such as records **1405–1420**, each associated with a different flight. For each flight identified by flight number in field **1425**, the seat allocation database **1400** includes the departure date of the flight in field **1430** and the respective inventory available in each inventory class in fields **1435** through **1440**. In addition, the seat allocation database **1400** preferably includes an indication of the total number of seats booked on the flight in field **1445** and total capacity available on the flight in field **1450**.

FIG. **15** illustrates an exemplary forecast and demand analysis database **1500**, which records each selling price for each fare class for a given flight, and the forecasted demand at each selling price as established by the RMS **500**. As previously indicated, when a flight is first added to the flight schedule of an airline **120**, a record of the initial price for each fare class and the forecasted demand is preferably created in the forecast and demand analysis database **1500**. In addition, new records are preferably created for each new selling price that is established for each fare class by the RMS **500**, as part of the dynamic inventory reallocation process.

The forecast and demand analysis database **1500** includes a plurality of records, such as records **1505–1525**, each associated with a different selling price for a given fare class on a given flight. For each flight number identified in field **1530**, the forecast and demand analysis database **1500** includes the departure date, and origin and destination cities in fields **1535** through **1545**, respectively, and the corresponding offered prices and fare classes in fields **1550** and **1555**, respectively. Finally, the forecast and demand analysis database **1500** preferably records the actual quantity of tickets sold by the airline at each offered price for each fare class in field **1560** and the corresponding forecasted quantity

in field **1565**. The actual quantity of tickets sold may be recorded in field **1560** in real-time as tickets are actually sold or by means of batch processing on a periodic basis.

PROCESSES

As discussed above, the CPO management central server **200** preferably executes a CPO management process **1600**, shown in FIGS. **16***a* through **16***c*, to receive each CPO from a customer **110** and to compare the CPO against the rules of each airline in order to determine whether to accept, reject or counter the CPO on behalf of an airline. As illustrated in FIG. **16***a*, the CPO management process **1600** begins the processes embodying the principles of the present invention during step **1604**, when a customer or travel agent accesses the CPO management system **100**.

Thereafter, during step **1608**, the CPO management central server **200** will receive the customer information, itinerary, price and other restrictions from the customer **110** which are required to populate the customer database **600**, if required for a new customer, and the CPO database **900**. A record of the CPO is preferably created in the CPO database **900** with the received information during step **1612**, and with the status field set to "pending."

Appropriate legal language is preferably displayed or read to the customer **110** during step **1616**, and the CPO management system **100** will wait for an acknowledgment from the customer **110** to form a binding conditional purchase offer (CPO). The price is extracted from field **980** of the CPO database **900** and the appropriate customer information, including credit card number, is extracted from the customer database **600** during step **1620**. Thereafter, the merchant ID associated with the CPO management system **100**, together with an appropriate billing descriptor, the total purchase amount (preferably equal to the price specified by the customer **110**) and the credit card information, are transmitted to the credit card issuer during step **1624** for pre-authorization.

A test is then preferably performed during step **1628** to determine if an authorization code has been received from the credit card issuer. If it is determined during step **1628** that the credit card issuer has not authorized the purchase amount, then another credit card is preferably requested from the customer **110** during step **1632** and program control returns to step **1624** to continue processing in the manner described above.

If, however, it is determined during step **1628** that the credit card issuer has authorized the purchase amount, then the CPO is accepted for processing during step **1636** and program control continues to step **1640** (FIG. **16***b*). The CPO management process **1600** preferably executes the evaluation process **1700**, discussed below in conjunction with FIG. **17**, for each airline during step **1640**. The CPO record created during step **1612** is passed to the evaluation process **1700** for comparison against the CPO rules of one airline, such as the airline **120**, to generate a response for the airline to the given CPO. As previously indicated, the airline's response to a CPO may be to accept, reject or counter the CPO. As discussed further below, the evaluation process **1700** will return the airline's response to the CPO, as well as a flight number if the CPO is accepted or countered by the airline.

In an alternate embodiment, the evaluation process **1700** can be performed for each airline in a predefined sequence until one airline accepts the CPO. For example, the evaluation process **1700** can be performed in sequence based upon (i) the amount of inventory made available by each airline for sale to CPO customers, (ii) the CPO acceptance rate of each airline, as recorded in the airline database **700**, (iii) priorities negotiated by each airline, such as an airline priority over certain routes, or (iv) the highest commission rates paid by the airlines to the CPO management system **100**. In this manner, the sequence can be determined by factors that incent participation by the airlines, and/or by factors that optimize revenue to the CPO management system **100**. It is noted that in the preferred embodiment, the customer **110** will pay the price defined by the customer if the CPO is accepted by an airline, regardless of the minimum price the airline would be willing to accept or whatever sequencing criteria is utilized by the CPO management system **100** to process the CPO.

As shown in FIG. **16***b*, a test is preferably performed during step **1644** to determine if the CPO was accepted by at least one airline. If it is determined during step **1644** that the CPO was accepted by at least one airline then a further test is preferably performed during step **1648** to determine if the CPO was accepted by more than one airline. If it is determined during step **1648** that the CPO was not accepted by more than one airline then program control proceeds directly to step **1672** (FIG. **16***c*) to book the ticket.

If, however, it is determined during step **1648** that the CPO was accepted by more than one airline, then a tie breaker algorithm is preferably executed during step **1652** to determine which airline acceptance to utilize. For example, the tie breaker algorithm can select an airline offering an itinerary which maximizes the convenience to the customer **110**, maximizes the profit to the CPO management system **100** or optimizes the inventory available for sale by the CPO management system **100**. It is noted that in the alternate embodiment, where the evaluation process **1700** is performed for each airlines in a predefined sequence until one airline accepts the CPO, a tie breaker algorithm will not be required. In a further alternate embodiment, the customer **110** may select for himself which airline acceptance to utilize. Thereafter, program control proceeds to step **1672** (FIG. **16***c*) to book the ticket.

In order to book the ticket, the information required to create a passenger name record (PNR) is extracted from the customer database **600**, the CPO database **900** and the inventory and flight information received from the evaluation process **1700** or CRS **400**. As previously indicated, a PNR generally includes the following parameters: record number, passenger name(s), address for ticketing, billing information, such as credit card number, flight number(s) for all segments, carrier(s), seat assignments, inventory class, aircraft type, airline-issued authorization code for discounted fare, selling price, and additional comments.

Thereafter, during step **1674**, the PNR is transmitted to the airline reservation system **150** of the airline upon which the ticket will be booked or the CRS **400** to establish a reservation. The CPO management process **1600** will then transmit the merchant ID associated with the CPO management system **100**, together with an appropriate billing descriptor, the total purchase amount (preferably equal to the price specified by the customer **110**) and the credit card information, to the credit card issuer during step **1678** for payment.

The record of the CPO in the CPO database **900** is updated during step **1682** with the assigned PNR number and the status field is changed to "accepted." Finally, an audit process **1800**, discussed below in conjunction with FIG. **18**, is executed by the CPO management process **1600** during step **1686** for each airline to maintain an audit trail for

each CPO which is processed by the CPO management system **100**. As previously indicated, the audit process **1800** will create an entry in the secured airline audit database **1200** which can be utilized to establish that a ticket was actually booked by the CPO management system **100** for each CPO which was accepted by at least one airline.

If, however, it was determined during step **1644** (FIG. **16***b*) that the CPO was not accepted by at least one airline, then a further test is performed during step **1656** to determine if at least one airline provided a counteroffer to the CPO. If it is determined during step **1656** that at least one airline did provide a counteroffer to the CPO, then the status of the initial CPO is changed to "counter", and a record of the counteroffer is preferably created in the CPO database **900** during step **1660**, for example using the original CPO number with a "-CO" extension. Thereafter, the counteroffer(s) are transmitted to the customer **110** during step **1664**. In an alternate embodiment, if the CPO is within predefined tolerances, rather than receiving one or more counteroffers, the customer **110** can be instructed to resubmit the CPO at a later time, or the CPO management system **100** can periodically reexecute the CPO until the CPO is accepted or until the CPO expires. It is noted that in view of the dynamic nature of the CPO rules, a CPO that is initially rejected may be subsequently accepted by one or more airlines.

A test is then preferably performed during step **1668** to determine if the customer **110** accepted one of the counteroffer(s). If it is determined during step **1668** that the customer **110** did accept a counteroffer, then program control proceeds to step **1672** (FIG. **16***c*) to book the ticket, in the manner described above. If, however, it is determined during step **1668** that the customer **110** did not accept a counteroffer, then program control proceeds to step **1696** (FIG. **16***c*), where the CPO management process **1600** will transmit the customer's rejection of the counteroffer to the airline(s) making the counteroffer. Thereafter, during step **1698**, the CPO management process **1600** will update the status of the counteroffer associated with the CPO in the CPO database **900** to "rejected." Program control proceeds to step **1686** in the manner described above and then terminates during step **1699**.

If, however, it was determined during step **1656** (FIG. **16***b*) that no airlines provided a counteroffer to the CPO, then program control proceeds to step **1690** (FIG. **16***c*), where the CPO management process **1600** will transmit the rejection of the CPO to the customer **110**. Thereafter, the status of the CPO in the CPO database **900** is updated to "rejected" during step **1694**. Program control proceeds to step **1686** in the manner described above and then terminates during step **1699**.

As discussed above, the CPO management process **1600** executes an evaluation process **1700**, during step **1640**. An exemplary evaluation process **1700** is shown in FIGS. **17***a* and **17***b*. In one embodiment, the evaluation process **1700** is preferably customized for each airline, so that each evaluation process **1700** receives the CPO record from the CPO management process **1600** in a standard format for comparison against the rules of the associated airline, such as the airline **120**, and returns a standard response of the airline to the CPO, such as accept, reject or counter. In addition, if the response of the airline is to accept or counter the CPO, the evaluation process **1700** preferably also returns the selected flight number.

As shown in FIG. **17***a*, the evaluation process **1700** initially extracts the O & D Pair from the CPO record during step **1705** and thereafter identifies all CPO rules in the secured airline rules database **1000** which are pertinent to the extracted O & D Pair during step **1710**. The customer defined restrictions from fields **960** through **995** of the CPO record are then compared to the corresponding airline defined restrictions from fields **1016** through **1044** of the secured airline rules database **1000** during step **1715**, for each CPO rule identified during the previous step.

Thereafter, a test is performed during step **1720** to determine if the CPO satisfies at least one airline rule. For example, CPO number 23452, stored in record **910** of the CPO database **900** (FIGS. **9***a* and **9***b*), defines an O & D Pair of New York (JFK) to Chicago (ORD). Thus, the evaluation process **1700** will access the secured airline rules database **1000** and identify all CPO rules for this O & D Pair. In the illustrative secured airline rules database **1000** shown in FIG. **10***a*, CPO rule number 23452 is identified as the only rule pertinent to this O & D Pair. Thereafter, each of the customer defined restrictions from fields **960** through **995** of the CPO number 23452 are compared to the corresponding airline defined restrictions from fields **1016** through **1044** of CPO rule number 23452. Since the customer is willing to make one stop (field **960**), the airline requirement of routing through Cleveland or Pittsburgh (field **1016**) can be satisfied. In addition, the customer's dates of departure and return requirements (fields **965** and **970**) satisfy the airline's dates, times and day of week requirements for both the departure and return legs of the trip (fields **1020** through **1032**). In addition, the number of passengers traveling satisfies the airline requirement set forth in field **1034** and the customer's price (field **980**) exceeds the airline's defined minimum price (field **1040**). Thus, CPO number 23452 will be accepted by the airline associated with CPO rule number 45687, provided that Q or K inventory is available (field **1042**) and the CPO is being processed between 7 and 21 days prior to flight (field **1044**).

In one embodiment, the CPO management system **100** allows the airlines **120**, **130** to specify CPO rules in a format that accepts a given CPO, conditioned upon the CPO management system **100** finding inventory available that meets the requirements of the airline, as set forth in the CPO rule, and the requirements of the customer **110**, as set forth in the CPO itself. For example, CPO rule number 23452, shown in FIG. **10***a*, is conditioned upon Q or K inventory being available.

Thus, if it is determined during step **1720** that the CPO satisfies at least one airline rule, then a further test is preferably performed during step **1725** to determine if any of the satisfied rules are conditioned on inventory being available.

If it is determined during step **1725** that none of the satisfied rules are conditioned on inventory being available, then program control proceeds directly to step **1735**, discussed below. If, however, it is determined during step **1725** that one or more satisfied rules are conditioned on inventory being available, then the CRS or ARS is accessed during step **1730** to identify flights, if any, with seats available and meeting the appropriate restrictions of both the satisfied CPO rule and the CPO.

Thereafter, a test is performed during step **1735** to determine if more than one flight satisfying the CPO has been identified. If it is determined during step **1735** that only one satisfactory flight has been identified, then program control proceeds directly to step **1745** (FIG. **17***b*), discussed below.

If, however, it is determined during step **1735** that more than one satisfactory flight has been identified, then one

flight is selected during step **1740** (FIG. **17***b*) which most closely matches the customer preferences set forth in the CPO or maximizes the convenience for the customer. Alternatively, each airline **120** can define its own criteria for the CPO management system **100** to utilize to select a single flight. Thereafter, the response will be set to "accept" during step **1745**, and program control will return to the CPO management process **1600** during step **1770** with the defined response and selected flight number.

If, however, it was determined during step **1720** (FIG. **17***a*) that the CPO does not satisfy at least one airline rule, then program control proceeds to step **1750** (FIG. **17***b*), where a further test is performed to determine if the CPO is within tolerances specified by the airline for generating a counteroffer. As previously indicated, the counteroffer rules database **1100** is preferably stored by each secured airline server **300** to maintain a set of tolerances which may be utilized by the CPO management system **100** to generate a counteroffer to a CPO on behalf of an airline, if the CPO is within predefined tolerances of one or more restrictions associated with a given CPO rule.

Thus, if it is determined during step **1750** that the CPO is within tolerances specified by the airline for generating a counteroffer, then a counteroffer is generated during step **1760** with the appropriate modified terms, as retrieved from the counteroffer rules database **1100**. Thereafter, the response will be set to "counter" during step **1765**, and program control will return to the CPO management process **1600** during step **1770** with the defined response and selected flight number.

If, however, it is determined during step **1750** that the CPO is not within tolerances specified by the airline for generating a counteroffer, then the response will be set to "rejected" during step **1755**, and program control will return to the CPO management process **1600** during step **1770** with the defined response and the selected flight number equal to null.

As previously indicated, the CPO management process **1600** preferably executes an audit process **1800** during step **1686** for each airline to maintain an audit trail for each CPO that is processed by the CPO management system **100**. An exemplary audit process **1800** is shown in FIG. **18**. The audit process **1800** will preferably create an entry in the secured airline audit database **1200** which can be utilized by the CPO management system **100** to establish that a ticket was actually booked by the CPO management system **100** for each CPO which was accepted by at least one airline. In this manner, the airlines **120** can be assured that the risk of a customer **110**, another airline **130** or a third party utilizing the CPO management system **100** to obtain the underlying price flexibility of the airline **120** is minimized.

As shown in FIG. **18**, the audit process **1800** will initially decrement the inventory in the secured airline rules database, if necessary, during step **1810**. For example, inventory should be decremented only if the ticket was ultimately booked by the associated airline, and the CPO rule which was utilized to accept the CPO actually included inventory released by the airline for sale to CPO customers, as opposed to a CPO rule which was conditioned upon inventory being available.

Thereafter, the audit process **1800** preferably creates a record of the CPO in the secured airline audit database **1200**, during step **1815**, including the CPO number, the PNR associated with the ticket issued by the CPO management system **100**, if any, to the customer **110**, and an indication of whether the ticket, if any, was booked on the corresponding airline. Program control will then return to the CPO management process **1600** during step **1820**.

An illustrative CPO rules generation process **1900**, shown in FIG. **19**, is preferably executed by the RMS **500** initially when a flight is first added to the flight schedule, and then periodically to reallocate and price available inventory in response to demand and external events. Thus, a test is initially performed during step **1905** to determine if the current inventory allocation by the RMS **500** is the initial allocation for the flight being allocated. If it is determined during step **1905** that the current inventory allocation is the initial allocation for the flight being allocated, then a further test is performed during step **1910** to determine if the flight is predicted, using conventional methods, to likely depart with empty seats.

If it is determined during step **1910** that the flight is not likely to depart with empty seats, then program control will terminate during step **1985**. If, however, it is determined during step **1910** that the flight is likely to depart with empty seats, then the CPO rule generation process **1900** will preferably allocate the empty seats to a special fare class for CPO customers during step **1915**. Thereafter, an appropriate minimum fare and other restrictions for such tickets will be established during step **1920**.

The pricing and restrictions database **1300**, seat allocation database **1400**, and forecast and demand analysis database **1500** for the flight will be updated during step **1925** with the newly established fare class, the allocated inventory and the initial price. Thereafter, the CPO rules generation process **1900** will preferably generate a CPO rule containing the allocated inventory, established minimum price and other restrictions during step **1930** and then transmit the generated CPO rule to the associated secured airline server **300** during step **1935**. Program control will then terminate during step **1985**.

If, however, it was determined during step **1905** that the current inventory allocation is not the initial allocation for the flight being allocated, then program control proceeds to step **1950** to reallocate a previous allocation for one or more fare classes of a given flight in order to minimize the unanticipated excess inventory delta **580**. Thus, a test is performed during step **1950** to determine if the forecasted demand exceeds the actual demand by more than a predefined tolerance for any fare class. In one embodiment, the RMS can make this determination utilizing the summary information recorded in fields **1560** and **1565** of the forecast and demand analysis database **1500**. In addition, the RMS **500** can generate the predefined tolerance utilized in step **1950** by analyzing historical demand information stored in the forecast and demand analysis database **1500** for prior periods.

If it is determined during step **1950** that the forecasted demand does not exceed the actual demand by more than a predefined tolerance for any fare class, then there is no need to reallocate the existing allocation and program control will terminate during step **1985**. It is noted that if actual demand exceeds forecasted demand, the RMS **500** can remove inventory that was previously allocated for sale to CPO customers.

If, however, it is determined during step **1950** that the forecasted demand does exceed the actual demand by more than a predefined tolerance for any fare class, then the RMS **500** will preferably allocate the excess capacity, or a portion thereof, for sale to CPO customers during step **1955**. Thereafter, an appropriate minimum fare and other restrictions for such tickets will be established during step **1960**.

The pricing and restrictions database **1300**, seat allocation database **1400**, and forecast and demand analysis database **1500** for the flight will be updated during step **1965** with the reallocated inventory and the established price. Thereafter, the CPO rules generation process **1900** will generate a CPO rule containing the allocated inventory, established minimum price and other restrictions during step **1970** and then transmit the generated CPO rule to the associated secured airline server **300** during step **1980**. Program control will then terminate during step **1985**.

CRUISE IMPLEMENTATION

Although the CPO management system **100** has been primarily illustrated herein as a system for selling airline tickets, the CPO management system **100** could be utilized to sell cruise tickets as well, as would be apparent to a person of ordinary skill. In such an embodiment, each secured airline server **300** would be associated with one or more cruise operators, as opposed to airlines, and each secured server **300** stores, among other things, the CPO rules defined by any associated cruise operators, in a similar manner to the secured server **300** described above in an airline implementation.

In addition, the revenue management system **500** and the airline reservation system **150** would be embodied as the revenue management system and reservation system, respectively, of each cruise operator. The cruise revenue management system establishes pricing and inventory information and generates CPO rules in a similar manner to the revenue management system described above in an airline implementation. Similarly, the cruise reservation system performs itinerary queries and makes reservations with the respective cruise operator in a similar manner to the reservation system described above in an airline implementation.

Thus, the CPO management system **100** receives CPOs from potential cruise travelers and evaluates the CPOs against a set of CPO rules provided by each of a plurality of cruise operators. An illustrative CPO database **2000** for a cruise implementation is illustrated in FIGS. **20***a* and **20***b*. The CPO database **2000** preferably stores a record of each CPO being processed by the CPO management system **100**, including the terms of the CPO and the associated status. The CPO database **2000** maintains a plurality of records, such as records **2005** and **2010**, each associated with a different CPO being processed by the system **100**. For each CPO identified by CPO number in field **2020**, the CPO database **2000** includes the date the CPO was received in field **2025**, and an identification (ID) number for the travel agent, if any, associated with the CPO in field **2030**. It is noted that the travel agent ID number stored in field **2030** may be utilized, for example, to index a historical database (not shown) of previous ticket purchases and CPOs associated with the travel agent.

In addition, the CPO database **2000** identifies the customer by name in field **2035**, and by identification number in field **2040**. Any companion passengers are identified in field **2045**. The ID number stored in field **2040** is preferably utilized to cross-reference the corresponding information stored for the customer in the customer database **600**.

The parameters of the customer's itinerary and other pertinent restrictions are stored in fields **2050** through **2085** of the CPO database **2000**. Specifically, the origin and destination ports are identified in fields **2050** and **2055**, respectively, and any port restrictions specified by the customer **110** are recorded in field **2060**. The departure and return dates are stored in fields **2065** and **2070**, respectively.

The CPO database **2000** preferably stores an indication of the total number of passengers traveling together in field **2075**, and sets forth the price the customer is willing to pay per ticket in field **2080**. Any other miscellaneous restrictions specified by the customer will be recorded in field **2085**, such as preferred cruise operator(s), berths, cabin assignments or meal times. Field **2090** records the current status of the respective CPO, such as pending, accepted, rejected or expired.

An illustrative secured rules database **2100** for a cruise implementation is shown in FIG. **21** for maintaining the CPO rules for one or more cruise operators associated with the respective secured server **300**. The secured rules database **2100** may be stored in an encrypted format to maintain the integrity and confidentiality of the highly sensitive information included in the CPO rules. The secured rules database **2100** maintains a plurality of records, such as records **2102** and **2104**, each associated with a different CPO rule. For each CPO rule identified by rule number in field **2110**, the secured rules database **2100** includes the associated restrictions defined by the respective cruise operator in fields **2112** through **2144**.

According to a feature of the invention, the CPO rules that are processed by the CPO management system **100** may be of varying complexity. The particular restrictions set forth in the illustrative secured rules database **2100** are representative of the principles of the invention only. A cruise operator, airline or other seller can incorporate a subset of such restrictions and/or incorporate additional restrictions, as would be apparent to a person of ordinary skill.

For illustrative purposes, the secured rules database **2100** shown in FIG. **21**, allows a cruise operator to create CPO rules by specifying some or all of the following restrictions in fields **2112** through **2144**: origin ports, cruise numbers (included or excluded), dates and times of departure, departure day of the week, dates and times of return, return day of the week, number of passengers traveling, length of haul, average yield per cabin, minimum price per ticket, inventory restrictions or cabin availability, and advance purchase requirements.

For example, record **2102**, shown in FIG. **21**, is associated with a CPO rule for a given cruise operator which specifies that the cruise operator will accept any CPO for travel from St. Thomas during the month of October, 1997, provided that (i) the customer travels on any cruise departing and returning on a Tuesday through Thursday, (ii) the tickets are booked within two (2) months of departure, (iii) the yield is at least $1.20 per mile per cabin and the price is at least $529 per person, (iv) is not for luxury class travel and (v) at least two (2) passengers are travelling together.

POST-SELL FOR MULTIPLE BINDS

As discussed above, if a CPO is accepted by more than one airline or cruise operator, then a tie breaker algorithm is preferably executed by the CPO management process **1600** during step **1652** to determine which airline acceptance to utilize. For example, the tie breaker algorithm can select a seller offering an itinerary which maximizes the convenience to the customer **110**, maximizes the profit to the CPO management system **100**, optimizes the inventory available for sale by the CPO management system **100** or permits the customer **110** to select for himself which airline or cruise operator acceptance to utilize. In an alternate implementation, if a CPO is accepted by more than one cruise operator, the CPO management system **100** executes a post-sell multi-bind process **2200**, shown in FIG. **22**, to

permit each accepting seller to directly market to the customer **110** and post-sell their product. Thus, the customer **110** still selects for himself which cruise operator acceptance to utilize, based on materials or incentives furnished by each seller. The customer **110** is still bound by the CPO management system **100**, in accordance with the terms of the CPO. In other words, the customer **110** is obligated to purchase the goods or services specified by the CPO, but the buyer must decide which cruise operator to utilize, based on materials provided to the customer **110** directly by each accepting cruise operator.

For example, a customer **110** may submit a CPO for a cruise during the month of March, 1998, anywhere in the Virgin Islands, in a grade A cabin with late dining, for $800.00. The CPO is provided to a plurality of cruise operators. Three cruise operators accept the CPO. The CPO management system **100** then binds the customer **110** on the credit card account identified with the offer, in accordance with the restrictions of the CPO. The CPO management system **100** then provides a channel of communication between the customer **110** and the accepting sellers, or provides the customer contact information to each accepting cruise operator, who each attempt to market their product in an attractive manner. The customer **110** then selects one of the three accepting sellers. Thus, each cruise operator knows that they have a one-in-three chance of selling a cruise, at the price specified by the CPO. It is anticipated that cruise operators would aggressively market to such guaranteed purchasers, particularly in view of the high marginal profits associated with each cruise traveler.

It is noted that the channel of communication provided by the CPO management system **100** between the customer **110** and each accepting seller may be an interactive web-site or other electronic mechanism that permits each accepting seller to present the customer **110** with detailed information about the cruise they are attempting to market. For example, the interactive web-site might include virtual representations of different aspects of the cruise package, such as the actual cruise ship and cabins, as well as the various ports that the cruise will visit and the available activities. In this manner, the buyer can explore the virtual cruise representation using known technology.

FIG. **22** illustrates an illustrative post-sell multi-bind process **2200** which may be implemented by the CPO management central server of FIG. **2** to permit each accepting seller to directly market to the customer **110** in an attempt to post-sell their product. The post-sell multi-bind process **2200** is preferably executed by the CPO management process **1600** during step **1652**, in lieu of the tie breaker algorithm, to determine which cruise operator acceptance to utilize. As illustrated in FIG. **22**, the post-sell multi-bind process **2200** begins during step **2210**, by instructing the accepting cruise operators or other sellers to provide post-sell information for a designated customer **110**. The CPO management system **100** then preferably receives the post-sell information from the accepting operators during step **2220** and transmits, or otherwise makes available, the received information to the customer **110** during step **2230**. Finally, the post-sell multi-bind process **2200** receives the decision of the customer **110** regarding which operator to utilize, before program control returns to the CPO management process **1600** during step **2250**.

In an alternate implementation, if a CPO is accepted by more than one cruise operator, then the CPO management system **100** can bind each of the accepting sellers to the one CPO. The original buyer can be assigned one of the sellers in accordance with the tie breaker algorithm or the alternative post-sell multi-bind process **2200** disclosed herein. In this manner, the CPO management system **100** can then resell the excess inventory to other buyers at or above the price associated with the initially accepted CPO.

EXCLUDED SELLER CPO EVALUATION

As previously indicated, a CPO submitted by a customer **110** can specify one or more preferred airline(s), cruise operators or other sellers, as applicable. Thus, the CPO management system **100** will provide the CPO to each specified seller to determine if one or more of the sellers are willing to accept the CPO. In a supplemental embodiment, the CPO management system **100** preferably executes an excluded seller CPO evaluation process **2400**, discussed below in conjunction with FIGS. **24***a* and **24***b*, to provide the CPO to the excluded sellers who may make counteroffers to the customer **110** before one of the specified sellers accepts the CPO. The excluded sellers may make counteroffers which are more favorable than the original terms of the CPO specified by the customer **110**, in an attempt to obtain the business. In this manner, the CPO management system **100** can sell the rights to receive CPO information to excluded sellers or collect a larger percentage commission for any counteroffers which are accepted by a customer **110**.

For example, in the cruise industry, first time cruisers tend to develop a specific brand loyalty. Thus, when considering future cruises, such customers **110** may submit a CPO to a very limited number of cruise operators. The CPO management system **100** would submit the CPO to the specified cruise operators, in accordance with the terms of the CPO, and also submit the CPO to one or more excluded cruise operators. The CPO management system **100** preferably utilizes an excluded operator counteroffer database **2300**, shown in FIG. **23**, to maintain any counteroffers received from the excluded operators, before the CPO is accepted by one of the customer-specified operators.

An illustrative excluded operator counteroffer database **2300** for a cruise implementation is shown in FIG. **23**. The excluded operator counteroffer database **2300** maintains a plurality of records, such as records **2305** through **2315**, each associated with a different counteroffer received from an excluded operator. For each counteroffer identified by number in field **2325**, the excluded operator counteroffer database **2300** includes the corresponding CPO number, a customer identifier, the excluded operator, the terms of the counteroffer and the associated status in fields **2330** through **2350**, respectively. For example, if a customer's CPO initially specified that the offer be submitted to Holland AmericaLine or Seaborn Cruise Lines, the CPO management system **100** might first submit the offer to Carnival, Princess and Royal Caribbean Cruise Lines. As shown in FIG. **23**, each of the excluded operators submit counteroffers of $600, $600 and $575, respectively. If none of the operators originally specified by the customer's CPO have not yet accepted, then the customer **110** is provided the option of accepting one of the counteroffers. If the customer **110** accepts a counteroffer, then the customer **110** is bound to the terms of the counteroffer, and the original CPO is cancelled.

FIGS. **24***a* and **24***b* describe an illustrative excluded seller CPO evaluation process **2400**. This process **2400** may be implemented by the CPO management central server of FIG. **2** to provide the CPO information to the sellers excluded by the terms of the original offer. Those excluded sellers can then attempt to obtain the business, before one of the sellers specified by the terms of the CPO accepts the CPO. As discussed below, the excluded seller CPO evaluation process

2400 is preferably executed in conjunction with the CPO management process 1600. As illustrated in FIG. 24*a*, the excluded seller CPO evaluation process 2400 begins during step 2405, upon receipt of a CPO from a customer 110 and storage of the CPO in the CPO database 900 or 2000. Thereafter, the CPO is evaluated during step 2410 to retrieve any operators specified by the customer 110. The operator database is accessed during step 2415 to identify potential operators to which the CPO information can be provided.

A test is then performed during step 2420 to determine if there are one or more operators excluded from the terms of the CPO. If it is determined during step 2420 that no operators are excluded from the customer's CPO, then the CPO management process 1600 continues operation as described above. If, however, it is determined during step 2420 that one or more operators are excluded from the customer's CPO, then the CPO information is preferably transmitted to each specified and excluded operator during step 2430. It is noted that the CPO can be provided to excluded operators before specified operators, or concurrently.

Any counteroffers are then received from the excluded operators during step 2435, and stored in the excluded operator counteroffer database 2300 during step 2440. Each of the received counteroffers are then presented to the customer 110 during step 2445. A test is then performed during step 2450 to determine if the customer 110 accepts any of the counteroffers before the original CPO is accepted by any of the specified operators. If it is determined during step 2450 that the customer 110 does not accept any of the counteroffers before the original CPO is accepted by any of the specified operators, then the CPO management process 1600 continues operation as described above.

If, however, it is determined during step 2450 that the customer 110 has accepted a counteroffer before the original CPO is accepted by any of the specified operators, then the original CPO is terminated or cancelled and the status of the original CPO in the CPO database 900, 2000 is changed to "cancelled" during step 2460. Thereafter, the status of the accepted counteroffer is changed to "accepted" and the status of the rejected counteroffers, if any, are changed to "rejected" in the excluded operator counteroffer database 2300 during step 2465. Finally, program control returns to the CPO management process 1600 and continues in the manner described above.

Although the post-sell multi-bind process 2200 and the excluded seller CPO evaluation process 2400 have been illustrated herein in a cruise embodiment, it is noted that the post-sell multi-bind process 2200 and the excluded seller CPO evaluation process 2400 are applicable in other industries as well, including the airline and other travel-related industries, the long distance telephone industry and the finance industry, as would be apparent to a person of ordinary skill.

It is to be understood that the embodiments and variations shown and described herein are merely illustrative of the principles of this invention and that various modifications may be implemented by those skilled in the art without departing from the scope and spirit of the invention.

For example, as previously indicated, although the present invention has been illustrated in an airline and cruise environment, the CPO management system 100 could be utilized to sell any item, as would be apparent to a person of ordinary skill.

We claim:

1. A method for using a computer to process the sale of a cruise ticket, comprising:

receiving by said computer a first conditional purchase offer from a customer for the purchase of said cruise ticket, wherein said first conditional purchase offer is a binding offer including a customer-defined price;

receiving a payment identifier specifying a credit card account for use in providing payment for said cruise ticket;

after receiving said first conditional purchase offer and said payment identifier, querying a database of seller-defined rules provided by a plurality of sellers to determine if said cruise ticket is to be sold to said customer for said customer-defined price, said seller-defined rules including prices which are concealed from said customer;

if no cruise ticket is to be sold to said customer after said querying, transmitting a rejection of said first conditional purchase offer to said customer; and

taking an action to deter said customer from submitting a second conditional purchase offer for said cruise ticket.

2. The method of claim 1 wherein said action comprises rejecting said second conditional purchase offer.

3. The method of claim 1 further comprising:

receiving an express authorization to charge said credit card account to pay for said cruise ticket.

4. The method of claim 3 wherein said express authorization is received from a credit card issuer.

5. The method of claim 1 wherein said database is stored in a computer reservation system.

6. A system for processing the sale of a cruise ticket, comprising:

a memory device storing a program;

a processor in communication with said memory;

said processor operative with said program to:

receive a first conditional purchase offer from a customer for the purchase of said cruise ticket, wherein said first conditional purchase offer is a binding offer including a customer-defined price;

receive a payment identifier specifying a credit card account for use in providing payment for said cruise ticket;

after receiving said first conditional purchase offer and said payment identifier, query a database of seller-defined rules provided by a plurality of sellers to determine if said cruise ticket is to be sold to said customer for said customer-defined price, said seller-defined rules including prices which are concealed from said customer;

if no cruise ticket is to be sold to said customer after said querying, transmit a rejection of said first conditional purchase offer to said customer; and

taking an action to deter said customer from submitting a second conditional purchase offer for said cruise ticket.

7. The system of claim 6 wherein processor is operative to deter said customer from submitting said second conditional purchase offer by rejecting said second conditional purchase offer.

8. The system of claim 6 wherein said processor is operative to:

receive an express authorization to charge said credit card account to pay for said cruise ticket.

9. The system of claim 8 wherein said express authorization is received from a credit card issuer.

10. The system of claim 6 wherein said database is stored in a computer reservation system.

11. A computer system for processing the sale of goods or services, comprising:

means for receiving a first conditional purchase offer from a customer for the purchase of said cruise ticket, wherein said first conditional purchase offer is a binding offer including a customer-defined price;

means for receiving a payment identifier specifying a credit card account for use in providing payment for said cruise ticket;

means for, after receiving said first conditional purchase offer and said payment identifier, querying a database of seller-defined rules provided by a plurality of sellers to determine if said cruise ticket is to be sold to said customer for said customer-defined price, said seller-defined rules including prices which are concealed from said customer;

means for, if no cruise ticket is to be sold to said customer after said querying, transmitting a rejection of said first conditional purchase offer to said customer; and

means for taking an action to deter said customer from submitting said second conditional purchase offer for said cruise ticket.

12. An article of manufacture comprising:

a computer readable medium comprising instructions for;

receiving a first conditional purchase offer from a customer for the purchase of a cruise ticket, wherein said first conditional purchase offer is a binding offer including a customer-defined price;

receiving a payment identifier specifying a credit card account for use in providing payment for said cruise ticket;

after receiving said first conditional purchase offer and said payment identifier, querying a database of seller-defined rules provided by a plurality of sellers to determine if said cruise ticket is to be sold to said customer for said customer-defined price, said seller-defined rules including prices which are concealed from said customer;

if no cruise ticket is to be sold to said customer after said querying, transmitting a rejection of said first conditional purchase offer to said customer; and

taking an action to deter said customer from submitting a second conditional purchase offer for said cruise ticket.

* * * * *